

**FIFTH FIVE-YEAR REVIEW REPORT FOR
CARSON RIVER MERCURY SUPERFUND SITE
WASHOE, CARSON CITY, STOREY, LYON AND CHURCHILL
COUNTY, NEVADA**



PREPARED BY

U.S. Army Corps of Engineers

Seattle District

FOR

U.S. Environmental Protection Agency

Region 9

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Executive Summary

This is the fifth Five-Year Review of the Carson River Mercury Superfund Site located in Washoe, Carson City, Storey, Lyon, and Churchill Counties, Nevada. The purpose of this Five-Year Review is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this Five-Year Review was the signing of the previous Five-Year Review on September 28, 2018.

The Carson River Mercury Superfund Site begins on the eastern edge of Carson City, Nevada, and some portions of the Washoe Lake watershed, and includes more than 130 miles of mercury-contaminated river, reservoir, and wetland water and sediments in the middle and lower portions of the Carson River system, and soils and tailings at more than 200 mill sites where mercury was used to process gold and silver ore mined from the Comstock Lode. The Carson River Mercury Superfund Site also encompasses areas where mercury contamination has come to reside due to erosion from the mill sites.

In 1995, Environmental Protection Agency (EPA) signed the Record of Decision for Operable Unit 1: Surface Soil to select the final remedy for the upland mercury-contaminated mills, tailings, and soils. The remedy includes surface soil removal and/or capping of four residential areas in Dayton and Silver City, where mercury exceeded site-specific cleanup levels for soils. Institutional controls were part of the Record of Decision for these properties to ensure that any subsurface soils remaining with mercury and arsenic which exceeded cleanup levels were not disturbed. Institutional controls also included development of a Long-Term Sampling and Response Plan to ensure that any residential development in presently open land use areas known or suspected to be impacted by mercury includes characterizing mercury levels in surface soils and, if necessary, addressing impacted soils. The Dayton and Silver City remediated areas achieved construction completion in December 1999.

EPA signed an Explanation of Significant Differences in 2013 to update the cleanup level for arsenic and to add lead as a chemical of concern. EPA clarified that those residential properties with lead or arsenic co-located with mercury above background levels could be considered impacted by contamination from the mill sites. The Explanation of Significant Differences modifies the Carson River Mercury Superfund Site boundaries definition based on the contamination zones. The digitized Carson River Mercury Superfund Site sampling data includes historical records and continues to be updated with additional data over time. EPA finalized the Long-Term Sampling and Response Plan on September 28, 2018. EPA also has plans to expand residential soil sampling activities for additional properties for select areas in late summer/fall 2023. Based on the results of soil sampling and signed agreements with property owners, EPA is planning to conduct remedial action activities in a multi-year effort.

The remedy is functioning as intended in the decision documents. However, effective implementation requires consistent communication between Nevada Division of Environmental Protection and local agencies about potential construction in affected areas, and this has been lacking in some counties. While most counties have a mechanism in place to alert Nevada Division of Environmental Protection

of soil disturbances in the site's potential affected areas, there are a limited number of procedures in place to enforce sampling requirements. Exposure assumptions have remained unchanged since the last Five-Year Review. There are no changes in exposure pathways in the Carson River Mercury Superfund Site and the overall land use remains the same. EPA and the Nevada Division of Environmental Protection established the threshold level for mercury at 1.0 milligrams per kilogram in soils and tailings to determine the presence of Carson River Mercury Superfund Site-contaminated materials because mercury remains the sentinel compound for Carson River Mercury Superfund Site-related contamination.

The remedy at the Carson River Mercury Superfund Site currently protects human health and the environment because the initial excavation and off-site disposal is complete and institutional controls were finalized with the 2018 Long-Term Sampling and Response Plan. However, in order for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness:

- Improve communication between local agencies and Nevada Division of Environmental Protection to provide adequate sampling coverage that adheres to the subsurface soil remedy for current and future residential developments; and
- Provide educational programs to local agencies and the community with updated information about the Carson River Mercury Superfund Site remedy, including conducting regular status meetings with local agencies.

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List of Acronyms and Abbreviations

EPA	United States Environmental Protection Agency
LTSRP	Long-Term Sampling and Response Plan
mg/kg	milligram per kilogram
NDEP	Nevada Division of Environmental Protection
Site	Carson River Mercury Superfund Site
USACE	United States Army Corps of Engineers

1. Introduction

The purpose of a Five-Year Review is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act Section 121, 40 Code of Federal Regulation Section 300.430(f)(4)(ii) of the National Contingency Plan and EPA policy.

This is the fifth Five-Year Review for the Carson River Mercury Superfund Site, Operable Unit 1¹. The triggering action for this statutory review is the completion of the previous Five-Year Review. The Five-Year Review has been prepared because hazardous substances, pollutants, or contaminants remain at the Carson River Mercury Superfund Site at levels that do not allow for unlimited use and unrestricted exposure.

The Carson River Mercury Superfund Site consists of two Operable Units, one of which will be addressed in this Five-Year Review. The 1995 Record of Decision only addresses Operable Unit 1 (surface soil remedy) for mill sites and those areas where tailings have contaminated surface soil and drainages (source areas). Operable Unit 2 includes Carson River and sediments and biota (generally the depositional/ecological areas). Operable Unit 2 is not addressed in this Five-Year Review because there is no selected remedy. An interim remedy for Operable Unit 2 was proposed on September 30, 2021, and EPA is currently considering public comments and finalizing the interim Record of Decision.

The Carson River Mercury Superfund Site Five-Year Review was led by Mohamed Ibrahim, Andy Bain, and Sarah Watson, EPA Region 9 Remedial Project Managers. Participants included Cynthia Wetmore and Cynthia Ruelas, EPA Region 9 Superfund Five-Year Review Coordinators, and from the U.S. Army Corps of Engineers (USACE): Kiley Zaubi, Environmental Engineer; Justin McNabb, Geologist, Katie Richwine, Physical Scientist. The review began on October 10, 2022.

¹ During cleanup, a site can be divided into distinct areas depending on the complexity of the problems associated with the site. These areas, called operable units, may address geographic areas of a site, specific site problems, or areas where a specific action is required.

Table 1. Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Carson River Mercury Superfund Site		
EPA ID: NVD980813646		
Region: 9	State: NV	City/County: Dayton, Virginia City and Silver City/Storey, Washoe County, Carson City/Carson City County, Lyon and Churchill County
SITE STATUS		
National Priorities List Status: Final		
Multiple Operable Units? Yes	Has the site achieved construction completion? No	
REVIEW STATUS		
Lead agency: EPA		
Author name: Mohamed Ibrahim, EPA Regional Project Manager		
Author affiliation: EPA Region 9		
Review period: 10/6/2022 - 6/30/2023		
Date of site inspection: 3/28/2023		
Type of review: Statutory		
Review number: 5		
Triggering action date: 9/28/2018		
Due date: 9/28/2023		

1.1. Background

The Carson River Mercury Superfund Site (Site) is located along the Carson River in Lyon, Storey, Churchill, Carson City and Washoe Counties, Nevada. The Site consists of the portions of the Carson Drainage and Washoe Valley in northwestern Nevada which are affected by mercury released from milling operations during the Comstock Lode mining era (Figures 1 and 2).

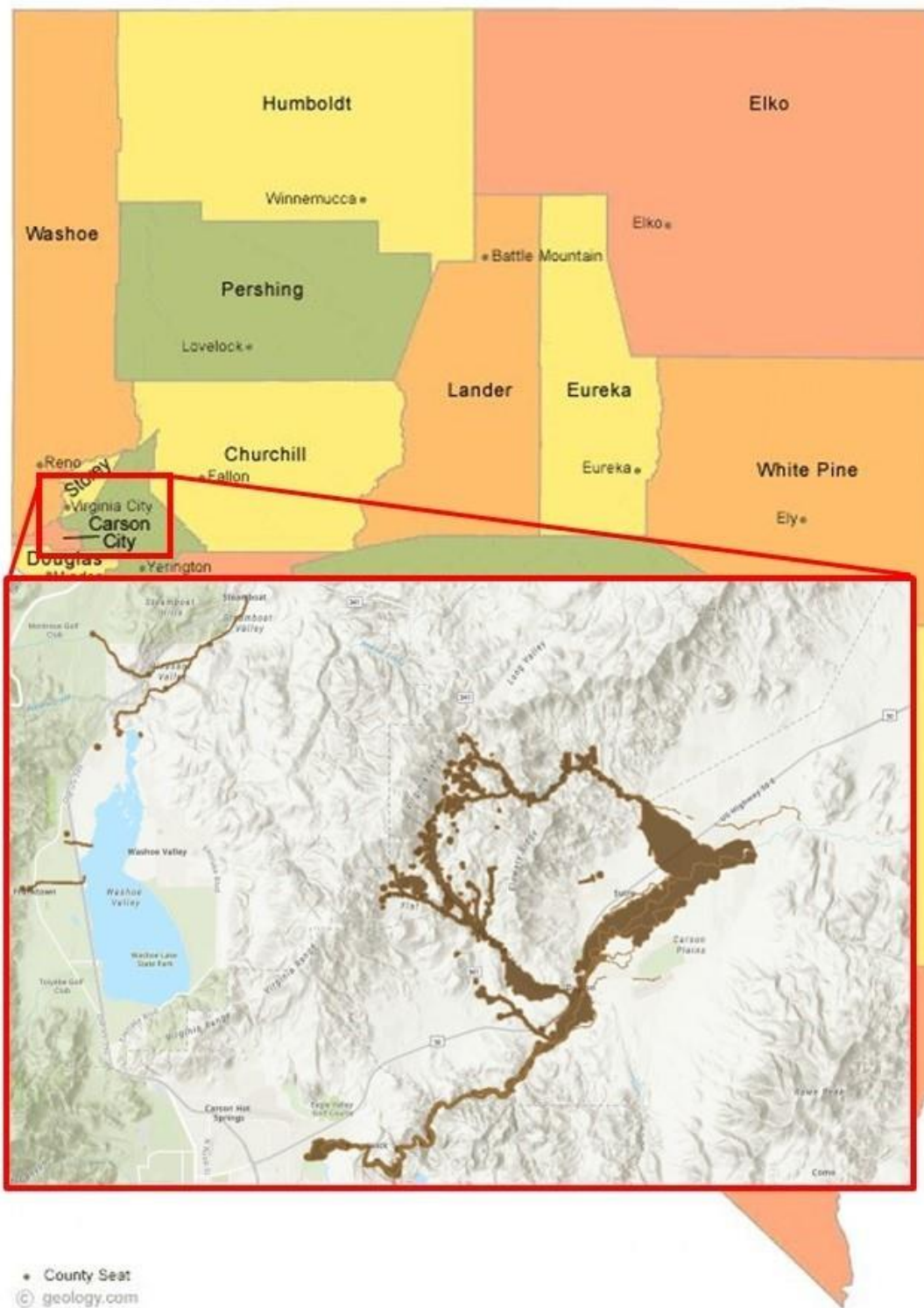
1.2. Physical Characteristics

The Site boundary of Operable Unit 1 consists of the former mill sites and areas where tailing piles have contaminated the surface soil and predominantly dry (ephemeral) drainages, especially those drainages flowing through Six-Mile Canyon, Gold Canyon and Daney Canyon. It also includes areas between the Empire Mill in Carson City, downstream along the Carson River to the easternmost lobe of the Six-Mile Canyon alluvial fan in Dayton Valley, where contamination has become located outside of drainage channels due to overbank deposits and/or flood irrigation practices. The Site also includes portions of the Truckee River drainage basin in Washoe Valley and Pleasant Valley. The Truckee River drainage basin includes the Big and Little Washoe Lakes which are the sources for Steamboat Creek, a tributary to the Truckee River. Direct release from Comstock-era mills along the shore of Big and Little Washoe Lakes, Steamboat Creek, tailings piles associated with these mills and subsequent flooding and flood irrigation has potentially contaminated near the shore and floodplain in these portions of Washoe County. The mill sites and associated tailings piles are considered the contamination source areas.

Contamination at the Site is the result of the Comstock mining era of the late 1800s when mercury was imported for use in the refining of ore. Ore mined from the Comstock Lode was transported to mill sites where it was crushed and mixed with mercury to amalgamate the precious metals. The mills were located in Virginia City, Silver City, Gold Hill, Dayton, Six-Mile Canyon, Gold Canyon, Seven-Mile Canyon, Washoe and Pleasant Valley and adjacent to the Carson River between New Empire and Dayton. An estimated 14 million pounds of elemental mercury were discharged into the Carson River system, primarily in the form of mercury-contaminated tailings. Additionally, two other naturally-occurring heavy metals (lead and arsenic) were concentrated in the process and discharged along with the mercury at levels that may present a human health concern. The mercury, lead and arsenic were transported primarily via fluvial pathways into the Carson River system along a 130-mile stretch from New Empire to its termination points at Carson Lake, Stillwater Wildlife Refuge and the Carson Sink. Episodic flooding and fluvial deposition have produced areas with high contaminant levels which represent “hot spots” within a wider area of possible contamination. Areas likely to have the highest levels of contaminants include the former mill sites, tailings piles and associated drainages below the mill sites and within the river system itself.

The Site is not considered to be located in a densely populated area of Nevada. According to 2020 US Census data, the populations of the Nevada counties comprising the Site are as follows: Washoe County, 486,492; Carson City County 95,558; Storey County, 4104; Lyon County, 59,235; and Churchill County, 25,516. The vast majority of the population of Washoe County is located in the Reno-Sparks metropolitan area, which is outside the boundaries of the Site. The majority of the residents from each of the five listed counties do not reside within the Site boundaries. In 2020, the population of Dayton, Nevada, in Lyon

County, where all but one of the remedial actions occurred, was 15,153, which is an increase from the previous census.



Source: Custom edited image from geology.com.

Figure 1. Location Map

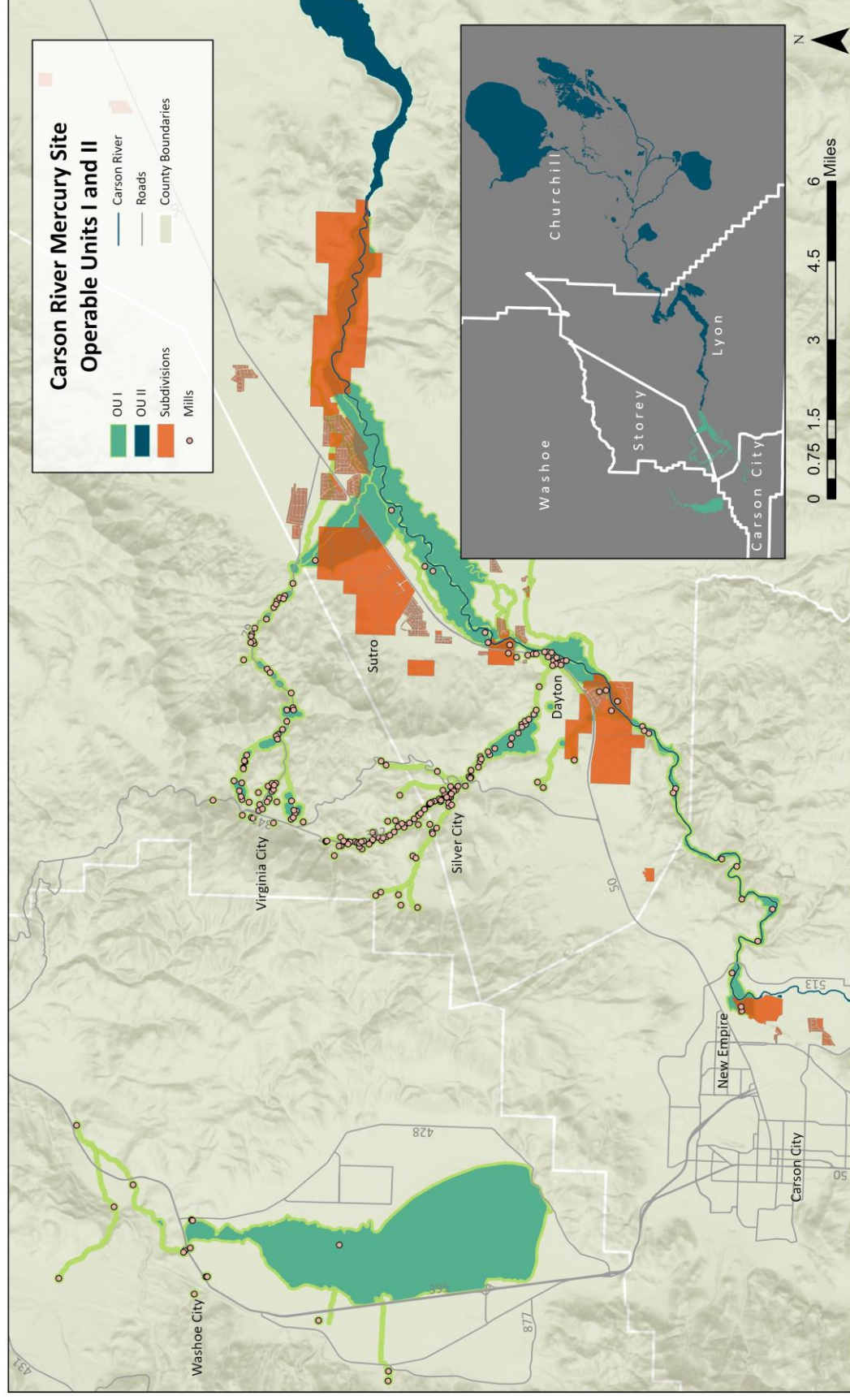


Figure 2. Detailed Location Map within the Surface Soil Remedy

2. Remedial Actions Summary

2.1. *Basis for Taking Action*

The contaminants of concern for Operable Unit 1 area of the Site are mercury, arsenic, and lead in soil. Mercury occurs naturally in the local Comstock ore, but at low levels. Approximately 14 million pounds of mercury were released into the environment during the Comstock gold and silver mining era, where mercury was added for gold and silver amalgamation. Naturally occurring metals arsenic and lead in the area were also concentrated in the milling waste stream. The presence of these contaminants in soil provided the basis for taking action, when co-located with a detection of mercury above the background level. The primary threat to human health is posed by ingestion of soil in a residential setting by children under the age of six.

2.2. *Remedy Selection*

EPA signed a Record of Decision on March 30, 1995, for the surface soil remedial action objective to reduce human health risks by reducing direct exposure to mercury equal to or greater than 80 milligrams per kilogram (mg/kg) in surface soils in residential areas. The selected remedy for surface soils of the Operable Unit 1 area of the Site includes the following:

- Excavation of approximately 5,000 cubic yards of contaminated soils, disposal at a Resource Conservation and Recovery Act hazardous and/or municipal waste landfill, and restoration of properties. In the event that there is residual contamination in the subsurface soil and it is not addressed, then this alternative may also include institutional controls; and
- Implementation of institutional controls to ensure that any residential development in present open land use areas known or suspected to be impacted by mercury includes characterizing mercury levels in surface soils and, if necessary, addressing impacted soils. These institutional controls will be referred to as the "Long-Term Sampling and Response Plan."

EPA selected no action for the Dayton Ditch because the health risks for this area were not great enough to warrant response actions such as capping or excavation, and the State of Nevada and the community expressed opposition to engineering controls because of the impact to the historic landmark and viewscape (i.e., restricting access with a fence).

EPA selected a mercury cleanup level² of 80 mg/kg to be protective of a resident child, considering the types of mercury generally found in the soil matrix and the bioavailability of those species. At the time, EPA selected a cleanup level for arsenic of 80 mg/kg based on the Nevada Contaminated Soil and

² EPA establishes a remediation goal or "cleanup level" for a chemical-specific substance at a site at a concentration level that would eliminate unacceptable high risks associated with potential exposure, while considering the cost and implementability of remedial alternatives. Both Decision Documents used the terms 'cleanup level' and 'action level' interchangeably.

Groundwater Policy. That Policy did not include a cleanup level for lead, and EPA did not select a cleanup value for lead.

In 2013, EPA signed an Explanation of Significant Differences to address issues identified in the 2008 Five-Year Review: the Site boundaries were not well defined, and updates to the cleanup levels were needed which included the current arsenic cleanup level and establishing a lead cleanup level. The Explanation of Significant Differences modifies the Site boundary definition to be based on contamination zones (Figure 2) and will be updated over time as additional data is collected.

EPA revised the surface soil cleanup levels for arsenic to follow Nevada Administrative Code 445A.2272, which is the successor to the Nevada Contaminated Soil and Groundwater Remediation Policy. Nevada Administrative Code 445A.2272 establishes cleanup levels at the background concentration. Nevada Division of Environmental Protection (NDEP) statistically evaluated arsenic data from the Carson River drainage basin to determine the naturally occurring background level for arsenic to be 32 mg/kg. In the Explanation of Significant Differences, EPA established a surface soil cleanup level for lead based on the EPA's Office of Solid Waste and Emergency Response Directive. The Office of Solid Waste and Emergency Response Directive on risk assessment and cleanup of lead in residential soil recommends that soil lead cleanup levels less than 400 mg/kg are generally safe for residential use. EPA considers the soil lead cleanup level to be an appropriate and protective "to be considered" requirement for the Site (Table 2).

Table 2. Soil Cleanup Levels from 2013 Explanation of Significant Differences

Chemical	Cleanup Levels (mg/kg)	Basis for Cleanup Level
Mercury	80	Site Specific Risk Assessment
Arsenic	32	Background Concentration, per Nevada Administrative Code 445A.2272
Lead	400	OSWER Directive based on risk ¹

¹ Memorandum: OSWER Directive: Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities, EPA OSWER Directive #9355.4-12, August 1994.
OSWER (Office of Solid Waste and Emergency Response)

EPA clarified in the Explanation of Significant Differences that the presence of elevated levels of arsenic and lead at a residential location, in the absence of mercury above natural background levels, shall not solely make that location subject to the management provisions of the Site. In the absence of mercury above typical background levels, elevated levels of arsenic and lead found at a residential location cannot be assumed to be Site-related. The arsenic and lead levels without mercury co-location may reflect natural background levels and a background level for mercury in surface soils in the Site was established at 1 mg/kg (as a threshold to indicate the presence of contaminated materials). If mercury is present above the background level, then further analysis will be conducted to determine whether the property has been affected by Site-related contamination and should be subject to the Long-Term Sampling and Response Plan.

2.3. *Remedy Implementation*

EPA completed cleanup of the four residential areas (MS001, MS002, MS004 and MS030) between August 4, 1998, and December 15, 1999. The remedial action involved excavation of the uppermost 2 feet of the surface soil that was determined by sampling to be above the cleanup threshold for mercury. Excavation was followed by capping with an equivalent volume of clean fill. Discovery of a historic mill building foundation and greater amounts of impacted soil at one of the areas required a larger excavation than anticipated. EPA removed over 9,087 cubic yards of mercury contaminated soil (nearly doubling the Record of Decision estimated quantity of 5,000 cubic yards). A fifth residential property (MS003) identified in the 1995 Record of Decision was not remediated after soil samples collected during the remedial design phase determined the property could be removed from the remedial action because mercury concentration in soil on the property were below site cleanup levels.

The NDEP and the EPA developed the draft Long-Term Sampling and Response Plan dated December 11, 2011, which defined the institutional control process to ensure new residential development does not provide a direct exposure pathway to mercury, arsenic and lead contaminated soils. Requirements in the draft 2011 Long-Term Sampling and Response Plan applied to any excavation activities that disturb greater than 3 cubic yards of soil including, but not limited to, minor and major property subdivision construction activities, swimming pool excavation/installation, utility ditching/ trenching, mine exploration, mining, tailings/waste rock reprocessing and any other construction/ renovation activity disturbing soils within the Site boundary, which may then come in direct contact with humans (Figure 3).

The key component of the draft Long-Term Sampling and Response Plan is notification to NDEP Bureau of Corrective Action. Notification to NDEP Bureau of Corrective Action prior to the soil disturbance is required for all property owners engaging in residential construction, development, or improvement of a property within the Site's Investigation Areas disturbing more than three cubic yards of soil or sediment, or any amount of tailings material. County planning departments are to notify the NDEP Bureau of Corrective Action of new single home construction or other surface disturbance totaling less than one acre. When a permit application is submitted for Construction General Permits under the Phase II Storm Water Rule to the NDEP Bureau of Water Pollution Control, NDEP Bureau of Corrective Action is to be notified if the construction includes sites greater than five homes or greater than, or equal to, one acre. The Bureau of Water Pollution Control Construction General Permits also applies to projects disturbing less than one (1) acre, but which are part of a larger common plan for development or sale that will ultimately disturb one (1) or more acres.

Other notifications to the Bureau of Corrective Actions of proposed new multi-unit residential construction within the Site (i.e., residential subdivisions) comes either by notification from the county planning agency acting on a zoning request by the developer or by the NDEP Bureau of Water Pollution Control. Under Nevada regulation 445A.6666, the developer of a new subdivision must submit a tentative map of the project with sufficient information to determine if the water supply system they intend to connect to has the capacity to serve the proposed customers. When the Bureau of Water Pollution Control receives a tentative map in the counties of the Site, they are to forward this information on to Bureau of Corrective Action. Bureau of Corrective Action staff then review the location of the proposed

development and if necessary, contact the developer to notify them of the project's location within the Site footprint and request a meeting to discuss the requirements of new housing construction under the Long-Term Sampling and Response Plan to satisfy those requirements. It is important to note that Bureau of Water Pollution Control only receives tentative maps of residential developments that are five parcels or greater in size; smaller parcels are handled at the County level.

Individual property owners can request that NDEP provide soil screening to determine approximate metals concentration levels. NDEP will arrange a site visit to conduct field portable x-ray fluorescence soil pre-screening to determine approximate on-site metal concentration levels for the contaminants listed in Table 2. Based on the results of soil screening, the landowner, in consultation with NDEP, can determine if more sampling should be conducted.

For property planned for profit or speculative development where contamination above two cleanup levels is suspected, the property owner must submit a sampling and analysis plan of the top two feet of soil to Bureau of Corrective Action for approval and implementation.

Once soil characterization is completed and the report is reviewed by NDEP Bureau of Corrective Action, a determination will be made whether the property needs further evaluation, remediation, or whether the construction/development project can proceed without further application of the Long-term Sampling and Response Plan.

EPA approved the final draft of the Long-Term Sampling and Response Plan on September 28, 2018. The specific sampling and analysis plan or SAP section in the plan was granted a conditional approval by the EPA Quality Assurance office at the time. EPA is currently reviewing this conditional approval with the EPA Quality Assurance office to determine next steps. The 1995 Record of Decision does not require NDEP to enforce the implementation of the Long-Term Sampling and Response Plan, rather NDEP will notify EPA of any non-compliance with the plan. EPA establishes the discretion of utilizing Comprehensive Environmental Response, Compensation, and Liability Act of 1980 for Sections 104 and 106 (Superfund Law) authorities to enforce compliance with the Long-Term Sampling and Response Plan.

Also, under the 2018 Long-Term Sampling and Response Plan, as a condition of properties that require remediation (as determined from results of sampling activities) that would still leave potentially contaminated soil below a protective clean soil barrier, the homeowner will be required to file an Environmental Covenant for the property. The Environmental Covenant is a form of a land use control under an environmental response project that imposes activity and use limitations to protect the integrity of the remedy.

Currently, site characterization activities continue in unknown, potentially contaminated areas within the Operable Unit 1 area of the Site, with an emphasis placed on existing residential areas where young children are present. NDEP Bureau of Corrective Action and EPA sponsored characterization activities of residential homes will continue based on the availability of public funding. Residential developers or residences built for profit and speculation utilize their own (non-public) funding for such activities.

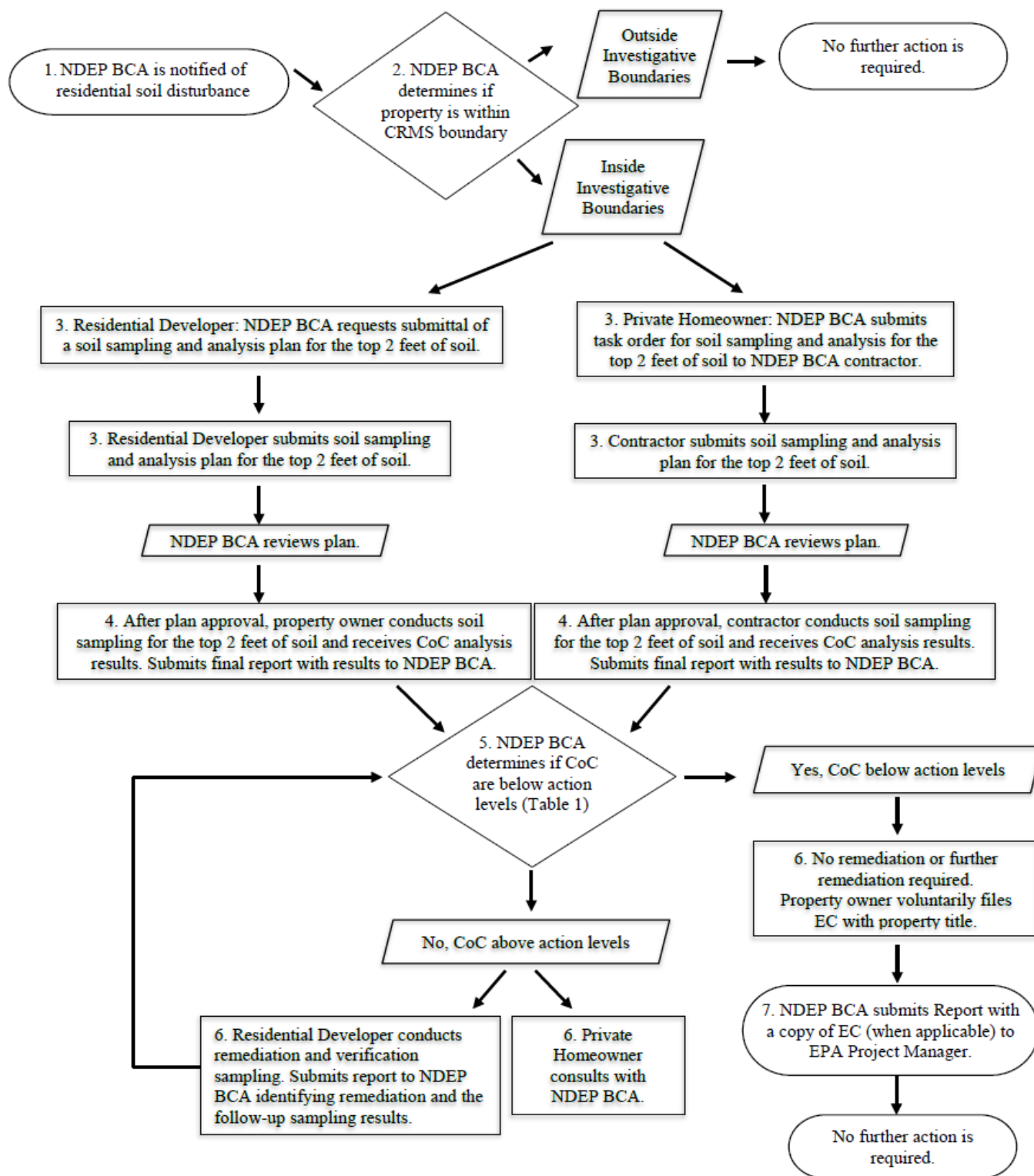


Figure 3. 2018 Long-Term Sampling and Response Plan Process.

Table 3. Summary of Planned and/or Implemented Institutional Controls

Media, Engineered Controls, and Areas	Institutional Controls Needed	Institutional Controls Called for in the Decision Documents	Impacted Parcel(s)	Objective	Title and Date (or planned)
Soil	Yes	Yes	Residential Developments, where subsurface soil (greater than or equal to 2 feet below ground surface) is impacted and is not addressed.	To reduce the exposure to elevated mercury, lead, or arsenic in soils at residential properties.	Long-Term Sampling and Response Plan for Residential Development, September 2018.

3. Progress Since the Last Five-Year Review

3.1. Previous Five-Year Review Protectiveness Statement and Issues

The protectiveness statement from the 2018 Five-Year Review for the Carson River Mercury Superfund Site stated the following:

The remedy at the Site is protective of human health and the environment in the short-term. The contaminated surface soils at four residential areas have been removed. The Long-Term Sampling and Response Plan has been finalized. However, to be protective in the long-term, the following actions should be taken:

- *Environmental Covenants for remediated properties need to be implemented,*
- *A Long-Term Sampling and Response Plan outreach protocol to inform the Counties of the notification procedures should be implemented, and*
- *Sample the soil disturbance at Our Park in Dayton, NV to ensure no contaminated soil has been brought to the surface, and outreach to Lyon Co. planning department to educate the park staff.*

The 2018 Five-Year Review included 3 issues and recommendations (Table 4).

Table 4. Status of Recommendations from the 2018 Five-Year Review

Location	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
Subsurface soil	Environmental Covenants have not been recorded on the previously remediated properties.	Work with the property owners to add Environmental Covenants.	Ongoing	Environmental Covenants were not recorded prior to the approval of the 2018 Long-Term Sampling and Response Plan. NDEP is working with property owners on an as-needed basis to ensure Environmental Covenants are appropriate for residential properties.	Click here to enter a date
Subsurface soil	Notification to NDEP by the County about possible excavation within the Site appears to not always occur.	Develop and implement a Long-Term Sampling and Response Plan outreach protocol to inform the Counties of the notification procedures.	Ongoing	During the 2023 Site Inspection, team members discussed with county officials where the boundaries of the Site are located within each county and shared geographical information system files to ensure that all appropriate properties will be characterized as needed per the 2018 Long-Term Sampling and Response Plan.	Click here to enter a date
Subsurface soil	The soil disturbance identified at the park should be investigated to determine if contaminated soil was inadvertently brought to the surface.	Sample the soil disturbance at Our Park in Dayton, Nevada to ensure no contaminated soil has been brought to the surface, and outreach to Lyon County planning department to educate the park staff.	Complete	A Sampling and Analysis Plan was submitted on June 28, 2022. Subsequent sampling determined that areas sampled within the park fenced area and surface areas outside the fence did not have any exceedances of site-specific cleanup levels. Concentrations of two mercury results in the storm drain culvert area adjacent to the park fence area exceeded site specific cleanup levels. However, the culvert area is outside of the park boundary and the samples were collected at a much lower subsurface depth of 6 to 24 inches. No exceedances of site-specific cleanup levels were observed in shallower samples. During the 2023 site inspection, the team visited Our Park in Dayton, Nevada and found no evidence regarding erosion or issues with disturbing the cap beneath the playground.	October 13, 2022

3.2. Work Completed at the Site During this Five-Year Review Period

Since implementation of the 2018 Long-Term Sampling and Response Plan, NDEP received multiple sampling and analysis plans and reports over the last five years for residential properties that include the following:

- Civil Improvement Plans- Santa Maria Ranch Phase 2 – Unit 1: 86 Lots in Lyon County (Dayton), Nevada
- Sampling and Analysis Plan for Mercury Site Characterization and Delineation, Melanie Drive, Lyon County, Nevada
- Sampling and Analysis Plan Phase 2 for Santa Maria Ranch, Lyon County, Nevada

- Traditions Village Soil Sampling Report, Sutro Tunnel Road, Dayton, Nevada
- Field Sampling Plan: Selected Sites in Carson River Mercury Site: Our Park, Cannon Property, and Carson River Park, Dayton Nevada

Results of these sampling activities performed can be found in Section 4.2.

In December 2022, EPA initiated soil sampling of a limited number of existing single-family residential properties in Operable Unit 1 under the Long-Term Sampling and Response Plan. Sampling activities included the yards of existing homes that were not historically sampled and not part of a recent development project prior to the implementation of the Long-Term Sampling and Response Plan. To help develop the target areas for sampling existing single-family residential properties, EPA began to review conceptual site model aspects, such as available data on or near a property area, proximity to a potential source area, such as tailings/mills, and other factors to prioritize properties that may be of higher risk of being impacted from historic mining activities. Two of the eight properties sampled had exceedances of the site-specific cleanup levels. EPA plans to expand residential soil sampling activities to additional properties for select areas in late summer/fall 2023. Based on the results of this and future soil sampling efforts and signed agreements with property owners, EPA is also planning to conduct remedial action activities in a multi-year effort.

4. Five-Year Review Process

4.1. *Community Notification, Involvement and Site Interviews*

4.1.1. Five-Year Review Public Notice

EPA distributed public notices by newspaper postings in the following newspapers: Nevada Appeal on Wednesday, March 1, 2023; in the Lyon County News Leader on Wednesday, March 8, 2023; and the Mason Valley News on Friday, March 31, 2023, stating that there was a Five-Year Review and inviting the public to submit any comments to the EPA. No public comments were received. The results of the review and the report will be made available at the Site information repository located online at epa.gov/superfund/carsonrivermercury and at the below repositories:

Churchill County Library
553 South Main Street
Fallon, Nevada, 89406
Dayton Valley Branch Library
321 Old Dayton Valley Road
Dayton, Nevada, 89403

Nevada State Library
100 North Stewart Street
Carson City, Nevada, 89701
Silver Springs Branch Library
3905 Highway 50 West
Silver Springs, Nevada, 89429

EPA's Superfund Records Center
75 Hawthorne Street
San Francisco, California, 94105

4.1.2. Site Interviews

During the Five-Year Review process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date. The interviews were conducted in-person by USACE personnel during the 2023 Site Inspection (Appendix F). David Friedman and Julia Hoeh, environmental scientists from NDEP indicate that they believe the remedy needs to be revisited as the Site is a large site and not a typical Superfund site as it spans across four counties. The environmental scientists suggest providing the option to delete portions of the Site from the Superfund National Priorities List as soil characterization takes place.

Some of the representatives from Washoe, Storey, Carson City, and Lyon Counties expressed confusion with state and/or county guidance for implementing the Long-Term Sampling and Response Plan. Representatives from Washoe County expressed concerns over not knowing the boundary of the Site within their county. Washoe County representatives also indicated there is no way to know that a county or state has approved/permitted any actions because the only form of communication is knowing that NDEP Bureau of Corrective Action needs to be contacted for a tentative map. It is important to note that Washoe County was not previously interviewed in the previous five-year review. A lack of communication over knowledge of the 2018 Long-Term Sampling and Response Plan is considered the biggest concern, along with identifying the Site boundaries. Storey County mentioned they would like the boundaries to be decreased when sampling is performed in accordance with the Long-Term Sampling and Response Plan to help reduce the size of the Site. The Carson City regulators that were interviewed also asked for an educational meeting with the EPA and NDEP to inform other county officials on the boundaries of the Site in their county and the possible actions needed when development occurs in these boundaries.

After completing interviews with local representatives, EPA staff discussed scheduling periodic meetings with the Counties to review in progress or planned projects and improve communication and coordination. During the meetings, opportunities to exchange information or provide educational materials could be shared between parties. NDEP could attend these meetings, with EPA being optional to attend. Meetings would be virtual or in-person, based on a party's availability.

Andy Bain, the former EPA Remedial Project Manager for the Site, recommended investigating the use of a robust notification system for select ground disturbance activities within the site, such as those from the One-Call Dig notification system or a private monitoring company that monitors various inputs in the construction permitting process. Both systems would send an alert to a specified list of recipients (typically utility companies), advising of an identified activity planned within a pre-determined area. The determined area would be defined from EPA sharing of Geographic Information System information and web mapping tools with the system provider. Both systems could aid in providing notification to NDEP of projects that either were unaware of the Site or are not part of the current notification process, such as those that are five parcels or less in the tentative map process.

4.2. Data Review

4.2.1. Soil Remedy Review

At the request of the State of Nevada Legislative Counsel Bureau, NDEP summarized the work completed up to 2020 in a March 2020 memorandum. Cleanup of contaminated soil has occurred through Removal Orders issued by EPA in 1991, the remedy selected in the Record of Decision performed by EPA in 1998 and under NDEP's implementation of the Long-Term Sampling and Response Plan.

Table 5. Work Under EPA Removal Orders

EPA Consent Order	Number of Properties	Levels of Mercury Contamination	Quantity of Contaminated Soil Removed or Capped
91-01	1	500 to 1,000 mg/kg ¹	1,525 tons removed (BCB property)
91-14	3	Non-detect to 430 mg/kg	5,505 cubic yards removed (Nevada Department of Transportation and Benum) 2,100 sq. ft cap (Our Park, Dayton)

¹mg/kg = milligrams per kilogram

Table 6. Work under the Record of Decision

Number of Properties	Levels of Mercury Contamination	Quantity of Contaminated Soil Removed
4	Non-detect to 9,000 mg/kg ¹	11,423 tons

¹mg/kg = milligrams per kilogram

One example of NDEP's oversight is demonstrated in the development of Santa Maria Ranch subdivision, located in Dayton, Nevada (Figure 2). Santa Maria Ranch subdivision is located: (1) within the 100-year floodplain of the Carson River and (2) adjacent to historic mill sites, tailing piles, and other related features. Both the floodplain and the nearby features are areas of likely contamination. Per the Long-Term Sampling and Response Plan, NDEP required investigation of the proposed subdivision properties prior to the start of earthwork construction and NDEP required ongoing monitoring based on the preliminary findings.

Table 7. Summary of Santa Maria Ranch Mitigation Efforts

Number of Lots Developed	Levels of Mercury Contamination	Quantity of Contaminated Soil
308	Non-detect to 500 mg/kg ¹	50 tons removed; 11,00 cubic yards capped

¹mg/kg = milligrams per kilogram

The focus of the subsurface soil remedy is the ongoing soil characterization and remediation to residential properties on an as-needed basis, in which NDEP will notify EPA of non-compliant residential properties. NDEP reviewed 29 subdivisions as of March 2020, within the Site boundaries and evaluated the properties in accordance with the Long-Term Sampling and Response Plan. Soil sampling was not required for fourteen new subdivisions as the subdivisions were determined to have a low probability of site contamination. The remaining fifteen subdivisions required soil sampling (Table 8).

Table 8. On-going Work under the Long-Term Sampling and Response Plan as of March 2020

Subdivision	Location	Pre-Construction Mercury Concentration (milligram/kilogram)	Post-Construction Mercury Concentration (milligram/kilogram)
Aspen Creek	Dayton	Non-detect to 300	Non-detect to 18
Bluestone Estates	Dayton	Maximum concentration 33	Maximum concentration 5.1
Carson River Estates	Dayton	Non-detect to 9.2	No remediation
Dayton Valley Country Club	Dayton	Maximum concentration 1.2	No remediation
Dayton Village	Dayton	Maximum concentration 0.2	No remediation
Daytona Heights	Dayton	0.02 to 20.6	No remediation
Desert Winds	Dayton	Non-detect	No remediation
Glen Vista	Dayton	Maximum concentration 0.7	No remediation
Onda Verde	Fallon	Non-detect to 52.8	No remediation
Riverpark ¹	Dayton	Non-detect to 18	Non-detect to 45
Riverview Estates	Dayton	Maximum concentration 2.1	No remediation
Santa Maria Ranch	Dayton	Non-detect to 500 mg/kg	Non-detect to 52.8
Sutro West	Dayton	Maximum concentration less than 80	No remediation
Traditions	Dayton	Non-detect to 320	Undeveloped
Walmsley Estates	Dayton	10 to 131	Capped with clean fill

¹The distribution of soil contamination is widely variable and heterogeneous. Detections of mercury, arsenic, and lead at concentrations in the final confirmation sampling study higher than the preliminary concentrations are not uncommon. The frequency and density of samples collected provide statistical confidence in the determination that potential risks are acceptable for no further action.

4.2.2. Climate Sustainability

EPA expects that the climate within the Site boundaries will change, bringing higher average and more extreme temperatures, increasing occurrences of wildfire, drought, and variable precipitation leading to landslide susceptibility and riverine/inland flooding as 95 percent of the boundaries are within a 100-year floodplain.

Annual precipitation historically in the northeastern and southwestern areas of the Site have experienced annual total precipitation between 5-28 inches, however, under a high climate change scenario, the estimates are projected to increase up to approximately 6 inches and as much as 33 inches by 2050.

Historically, the Site has seen a 1-in-10-year high temperatures ranging from 93-108 degrees Fahrenheit, however, under a high industrial emissions scenario, by 2050 temperatures are projected to range from 102-118 degrees Fahrenheit and by 2100 ranging from 107-122 degrees Fahrenheit. The hotter temperatures will increase evapotranspiration, and lower soil moisture. In the northern part of Nevada, the most intense precipitation comes in the form of warm, wet storms that cause faster snowpack melting, which increases streamflow and flooding very quickly. These events have caused significant flooding in the past three decades along the Carson River, with the most recent flood in 2017 and Spring 2023. The upstream portion of the Site is located within a high landslide susceptibility area, while the downstream portion is in an area of very low landslide susceptibility. Further, increases in temperature, intensified drought, and warmer falls are creating longer and more intense wildfire seasons in this region.

As the Site is projected to experience increases in both heavy rainfall events and extended dry periods that lead to periods of high flow and low flow, respectively, detections of total mercury and methylmercury concentrations in Carson River may increase as the climate changes. If monitoring results indicate increasing mercury levels, additional measures in future remedial strategy for the Site may need to be considered.

4.3. Site Inspection

The site inspection was conducted between March 28-30, 2023. In attendance were Mohamed Ibrahim and Sarah Watson from EPA, Julia Hoeh and Dave Friedman from NDEP, Kiley Zaubi and Justin McNabb from USACE, who met with representatives from the local municipalities and county officials in the Washoe, Storey, Lyon and Carson City counties. The purpose of the inspection was to assess the condition of the remedy and verify that the remedy is operating as intended.

NDEP Bureau of Water Pollution Control sends notifications to the Bureau of Corrective Actions when there is development in the Site that will need approval for stormwater and wastewater treatment systems. The process is automated for Storey, Lyon, and Churchill counties. Washoe County has their own health department that has delegated authority from the State of Nevada. Washoe County along with Carson City County still provide plans to NDEP Bureau of Water Pollution Control. For Storey and Lyon Counties, NDEP Bureau of Corrective Action is still the principal entity to inform developers about the sampling requirements after a development project is determined to be within the Site.

The site inspection team conducted several site visits to document whether the Long-Term Sampling and Response Plan remedy implementation is effective. Two sites, the Traditions and River Park Estates, had insufficient sampling activities performed that were not in accordance with the Long-Term Sampling Response Plan, according to the Soil Sampling Reports received by NDEP. Santa Maria Ranch Phase 2 has submitted a sampling plan to NDEP in May 2022 that follows the 2018 Long-Term Sampling and Response Plan but has not started construction on this expansion yet. The site inspection team visited Our Park to document erosion issues and issues with construction disturbing the cap beneath the playground; no obvious concerns were noted at the park.

Around Washoe Lake, the team was advised of three sites by NDEP that required testing; however, no concentrations were found above residential limits. The team met with Washoe County officials who were unaware that the boundaries of the Site are within the county. The 2013 Explanation of Significant Differences acknowledges that the institutional control as identified in the 1995 Record of Decision does *“not provide protection for public health from residential development in ...[Site] areas associated with Washoe Lake, even though it was recognized as an area with contaminants of concern.”* However, the Long-Term Sampling and Response Plan does include upland properties which were not impacted by the historic mill as within the Site. The Explanation of Significant Differences notes that these differences in how the Site is geographically defined in the ROD *“hampers the protectiveness and effectiveness of ...[Site] management and public health protections and is not consistent with the manner in which EPA defines a “site.”* Therefore, the EPA Site team is reviewing the current status of the Washoe Lake area and valleys to help clarify the noted inconsistency of site definitions and boundaries based on current language.

5. Technical Assessment

5.1. Question A: Is the remedy functioning as intended by the decision documents?

The remedy is functioning as intended with regard to the initial excavation and off-site disposal of contaminated soils which was completed between August 4, 1998, and December 15, 1999. Institutional controls for the Site were finalized on September 28, 2018, in which EPA delegates implementation of institutional controls to NDEP in the form of environmental covenants for newly developed residential properties or subdivisions. Multiple developments (of more than five houses) are in the process of implementing Sampling and Analysis Plans that have been reviewed by NDEP. In these cases, the remedy appears to be working.

However, communication about the process and requirements are lacking – and not all developers or individual property owners are aware of the requirements. During interviews, NDEP and county representatives expressed concerns over the implementation of the Long-Term Sampling and Response Plan. Counties that fall within the Site boundary are not fully aware of the current boundaries for the subsurface soil remedy and some areas do not have automated reporting to NDEP to conduct sampling. Several subdivision developments within the subsurface soil remedy do not have appropriate per parcel sampling (Appendix F). Some of the officials interviewed from Washoe County and Carson City County are unaware of the presence of the Site boundary within their watersheds. Washoe County indicated they are worried that a planned subdivision may be approved for development without any sampling plan in place. This subdivision is in the Steamboat Creek watershed and is impacted by a former mill in the area. Additionally, residential properties that are developed in groups smaller than five parcels are not reported to NDEP Bureau of Corrective Action for screening because they do not trigger stormwater or sewer development reporting requirements through the tentative map process. Instead, there is a reliance on counties to alert the NDEP Bureau of Corrective Action of ground disturbance activities within the Site boundary that do not come from those current notification processes. Also, there is no retroactive adjustment for a developer to sample or re-sample properties that were approved before the Long-Term Sampling and Response Plan was finalized in 2018. This results in developments with sampling that is inconsistent with the 2018 Long-Term Sampling and Response Plan, such as Traditions Village (in progress) or Santa Maria Ranch Phase 1 (completed). Sampling that does not follow the Long-Term and Response Plan could result in potentially deficient characterization of a property.

Additional institutional controls will be established on an ‘as-needed’ basis. Communication is lacking in some counties regarding awareness and details about the Long-Term Sampling and Response Plan, which is creating confusion with state and county regulators, residential developers, and homeowners. More educational outreach regarding the Plan may assist in reducing confusion.

5.2. Question B: Are the exposure assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives Used at the Time of Remedy Selection Still Valid?

The exposure assumptions have remained unchanged since the last Five-Year Review. Some applicable or relevant and appropriate requirements identified in the Record of Decision have been revised since the last Five-Year Review; however, no changes affect protectiveness of the remedy (Appendix C). There are no changes in exposure pathways in the Site and the overall land use remains the same.

The 2013 Explanation of Significant Differences and the 2018 Long-Term Sampling and Response Plan established Site cleanup levels for the contaminants (Appendix D). The 2013 Explanation of Significant Differences establishes site specific cleanup levels for lead and arsenic. The cleanup level for arsenic is based on a statistical evaluation of site-specific sample data, whereas the cleanup level for lead is based on EPA's Regional Screening Level. Although cleanup levels have been established for the Operable Unit 1 area of the Site, EPA and NDEP established the threshold level for mercury at 1.0 mg/kg in soils and tailings to determine the presence of Site-contaminated materials because mercury remains the sentinel compound for Site-related contamination. The presence of elevated levels of arsenic and lead at a particular location, in the absence of mercury above the natural background level, may not require the same level of management provided by the 2018 Long-Term Sampling and Response Plan.

5.3. Question C: Has Any Other Information Come to Light That Could Call into Question the Protectiveness of the Remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

6. Issues/Recommendations

Table 9. Issues and Recommendations Identified in the Five-Year Review

Issues and Recommendations Identified in the Five-Year Review:				
Subsurface Soil Remedy	Issue Category: Remedy Performance			
	Issue: Current implementation of the Long-Term Sampling and Response Plan is inconsistent. For example, inadequate communication between state and county regulators are preventing adequate soil management plans for residential soil testing within the Site boundaries, map boundary and characterization is incomplete. Record keeping is inadequate, and the notification process for single-family homes is inconsistent. There is also uncertainty in the quality of some of the construction pre-screenings.			
	Recommendation: Improve communication with local agencies to provide adequate testing coverage within the subsurface soil remedy for current and future residential developments. Educational programs and/or meetings are recommended to provide local agencies and the community updated information about the Site remedy. Review the practicality of using a robust monitoring and notification system, such as those used for the One-Call Dig alert or private monitoring system to improve notifications. Consider investigating site definition around the Washoe Lake area to help determine the “Site” boundary applicability. Conduct periodic check-ins with the counties, such as regularly scheduled meetings to review status of current or planned projects.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
Yes	Yes	EPA/State	EPA/State	6/30/2028
Subsurface Soil Remedy	Issue Category: Institutional Controls			
	Issue: Environmental Covenants have not been recorded on previously remediated properties.			
	Recommendation: Continue to work with the property owners to add Environmental Covenants for properties that have undergone development.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	State	EPA	6/30/2028

6.1. Other Findings

In addition, the following are recommendations that improve performance of the remedy but do not affect current and/or future protectiveness and were identified during the Five-Year Review:

- Local agencies in the Site are finding it challenging to acquire grants and aid from other federal agencies because the area is a Superfund site that is located within a floodplain. EPA is currently working with counties and other federal agencies on this finding.

7. Protectiveness Statement

Table 10. Protectiveness Statement

Protectiveness Statement(s)	
<i>Operable Unit:</i> Subsurface Soil	<i>Protectiveness Determination:</i> Short-term Protective
<i>Protectiveness Statement: The remedy at the Carson River Mercury Superfund Sites currently protects human health and the environment because the initial excavation and off-site disposal is complete and institutional controls were finalized with the 2018 Long-Term Sampling and Response Plan. However, for the remedy to be protective in the long-term, the following actions need to be taken to ensure protectiveness:</i> • <i>Improve communication between local agencies and Nevada Division of Environmental Protection to provide adequate sampling coverage that adheres to the subsurface soil remedy for current and future residential developments; and</i> • <i>Provide educational programs to local agencies and the community with updated information about the Carson River Mercury Superfund Site remedy, including conducting regular status meetings with local agencies.</i>	

8. Next Review

The next Five-Year Review report for the Carson River Mercury Superfund Site is required five years from the completion date of this review.

Appendix A: List of Documents Reviewed

- DR Horton, Inc, 2022. Traditions Village Soil Sampling Report, prepared by Brown and Cadwell for Carson River Mercury Superfund Site, Washoe, Carson City, Storey, Lyon, and Churchill Counties, Nevada. May 11.
- EPA (United States Protection Agency). 1995. Record of Decision, Carson River Mercury Superfund Site, Washoe, Carson City, Storey, Lyon, and Churchill Counties, Nevada. March 30.
- EPA, 2013. Explanation of Significant Differences for Carson River Mercury Superfund Site. September.
- EPA, 2018. Operable Unit 1: Long Term Sampling and Response Plan for Residential Development, prepared by Nevada Division of Environmental Protection, for Carson River Mercury Superfund Site, Washoe, Carson City, Storey, Lyon, and Churchill Counties, Nevada. September 28.
- EPA, 2023. Carson River Mercury Superfund Site Climate Vulnerability Assessment, Technical Memorandum. February 24.
- Federal Emergency Management Agency, 2023. Flood Maps. Website: <https://www.fema.gov/flood-maps>. Accessed May 12, 2023.
- Nevada Division of Environmental Protection (NDEP), 2020. Memorandum: Follow-up from February 6, 2020, Interim Finance Committee Meeting Regarding the Carson River Mercury Superfund Site, prepared by State of Nevada: Department of Conservation and Natural Resources for Carson River Mercury Superfund Site, Washoe, Carson City, Storey, Lyon, and Churchill Counties, Nevada, March 16.
- NDEP, 2022. Civil Improvements Plans- Santa Maria Ranch Phase 2- Unit 1, 86 Lots in Lyon County (Dayton), Nevada, prepared by State of Nevada Department of Conversation and Natural Resources for Carson River Mercury Superfund Site, Washoe, Carson City, Storey, Lyon, and Churchill Counties, Nevada. March 3.
- NDEP and Pinnacle Management, 2022. Sampling and Analysis Plan, Santa Maria Ranch Phase 2, Lyon County, Nevada prepared by McGinley and Associates for Carson River Mercury Superfund Site, Washoe, Carson City, Storey, Lyon, and Churchill Counties, Nevada. May 27.
- NDEP and Active Real Estate Partners, LLC, Silverhorn Series, 2022. Sampling and Analysis Plan for Mercury Site Characterization and Delineation, Melanie Drive, APN 016-311-67, Lyon County, Nevada, prepared by McGinley and Associates for Carson River Mercury Superfund Site, Washoe, Carson City, Storey, Lyon, and Churchill Counties, Nevada. June 16.
- NDEP, 2022. Field Sampling Plan: Selected Sites in Carson River Mercury Site: Our Park, Cannon Property, and Carson River Park, Dayton Nevada, prepared by Broadbent and Associates, Inc. for Carson River Mercury Superfund Site, Washoe, Carson City, Storey, Lyon, and Churchill Counties, Nevada. June 28.
- NDEP, 2022. Report of Findings: Selected Sites in Carson River Mercury Site: Our Park, Cannon Property, and Carson River Park, Dayton Nevada, prepared by Broadbent and Associates, Inc. for Carson River Mercury Superfund Site, Washoe, Carson City, Storey, Lyon, and Churchill Counties, Nevada. October 13.

US Geological Survey, 2023. US Landslide Inventory. Website: <https://www.usgs.gov/tools/us-landslide-inventory>. Accessed: May 12, 2023.

US Global Change Research Program, 2023. Fourth National Climate Assessment. Website: <https://nca2018.globalchange.gov/>. Accessed May 12, 2023.

State of Nevada, 2023. National Integrated Drought Information System. Website: <https://www.drought.gov/states/nevada>. Accessed May 12, 2023.

Appendix B: Site Chronology

Event	Date
Mercury-contaminated mill tailings discharged to the environment.	Mid to Late 1800s
Initial discovery of elevated mercury levels in the Carson River.	Early 1970's
Carson River Mercury Superfund Site receives final listing on the National Priority List.	August 1990
Mercury-laden tailings excavated and treated in response to an order by EPA.	November 1990 and August 1992
The Human Health Risk Assessment and the Remedial Investigation Report are published.	December 1994
The Feasibility Study is conducted.	December 1994
EPA signs the Record of Decision.	March 1995
Remedial Design begins.	April 1995
Remedial Design is completed.	September 1996
Remedial Action begins.	September 1996
The Superfund State contract is signed.	July 1997
Remedial Action construction period is completed.	August 1998 -January 1999 and August – December 1999
USACE completes the first Five-Year Review.	September 2003
The draft Long-Term Sampling and Response Plan (Plan) is developed.	January 2005
Nevada Division of Environmental Protection (NDEP) finalizes the brochure describing development permitting requirements in the Carson River area.	April 2008
USACE completes the second Five-Year Review.	September 2008
Environmental Covenants in-process are drafted to address disturbance of remediated areas, and EC's resulting from Long-Term Sampling and Response Plan actions made available to the public.	January 2012
EPA drafts the Explanation of Significant Differences (ESD) in-progress to address the Site boundary definition and change in cleanup levels for arsenic and lead.	August 2012
A revised LTSRP is drafted to address residential developments of less than five units or five acres.	September 2012
Archeological studies of historic mill sites are completed.	2012
EPA signs the ESD to address the Site boundary definition and changes in the cleanup levels for arsenic and lead.	September 2013
USACE completes the third Five-Year Review.	September 2013
EPA and NDEP completes the Long-Term Sampling and Response Plan. EPA completes the fourth Five-Year Review.	September 28, 2018
EPA issued the OU2 Proposed Plan.	September 30, 2021

Appendix C: Applicable or Relevant and Appropriate Requirements Assessment

Section 121 (d)(2)(A) of Comprehensive Environmental Response, Compensation, and Liability Act specifies that Superfund remedial actions must meet any Federal standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate requirements (ARARs). ARARs are those standards, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a Comprehensive Environmental Response, Compensation, and Liability Act site.

Changes (if any) in ARARs are evaluated to determine if the changes affect the protectiveness of the remedy. At the time the 1995 Record of Decision was signed, there were no federal or state laws concerning mercury, arsenic and lead cleanup levels that were considered to be chemical-specific ARARs for the cleanup of the surface soil remedy. However, there were standards from the next tier of requirements, termed “To Be Considered” (TBC) standards, which were determined to be germane to the Site cleanup. EPA determined the Nevada Contaminated Soil and Groundwater Remediation Policy was appropriate for the arsenic standard and selected that Policy’s cleanup level in the Record of Decision. For mercury, the section of the Policy that states that site-specific cleanup levels may be used at a site if they were developed using a scientifically valid risk assessment was used to adopt the mercury cleanup level determined by EPA based on the Human Health Risk Assessment. No standards for lead were presented in the Record of Decision.

The Nevada Contaminated Soil and Groundwater Remediation Policy cited in the Record of Decision is no longer in effect. Cleanup levels for soil in Nevada are now governed by Nevada Administrative Code (NAC) 445A.2272, as amended in 2009. The 2013 Explanation of Significant Differences and the Long-Term Sampling and Response Plan present the cleanup levels for site contaminants of concern in the Operable Unit 1 area, which are now based on toxicity. This will be further discussed in Appendix D.

Federal and State laws and regulations other than the chemical-specific ARARs that have been promulgated or changed since the 1995 Record of Decision are described in Table C-1. There have been no revisions to laws or regulations that affect the protectiveness of the remedy.

The following action- or location-specific ARARs have not changed in the past five years, and therefore there are no changes affecting protectiveness:

- Nevada Contaminated Soil and Groundwater Remediation Policy, June 25, 1992 (This policy is no longer in effect was replaced by Nevada Administrative Code (NAC 445A.2272) in the 2013 ESD)
- Fugitive Dust Emissions NAC 445.22037
- Executive Order on Protection of Wetlands. Executive Order 11990, 7(c)
- Wetland Protection Clean Water Act 404; 40 CFR Part 203; 33 CFR Part 320-330
- Archeological and Historical Preservation Act. 16 USC 469

Table C-1. Summary of ARAR Changes for Site in the Past Five Years

Requirement and Citation	Document	Description	Effect on Protectiveness	Comments	Recent Amendment Date
Contamination of soil: Establishment of action levels. Nevada Administrative Code (NAC 445A.2272)	2013 ESD	EPA Integrated Risk Information System is used to derive the Agency's RSLs. RSLs are consistent with NAC 445A.2272, as the successor to the Nevada Contaminated Soil and Groundwater Remediation Policy. RSLs are guidance, and not promulgated standards.	See Appendix D for a description of the effect on protectiveness.	Included in the NAC is the adoption of EPA's Integrated Risk Information System which is the basis for the EPA Regional Screening Levels (RSLs) used by Nevada to determine appropriate cleanup levels.	Changes to RSLs are documented in Appendix D.
Alternative Use of Mine Waste Solids Disposal Outside of Containment Nevada Bureau of Mining Regulation and Reclamation Guidance Document for Alternative Use of Mine Waste Solids- Disposal Outside of Containment, December 2017.	1995 Record of Decision	This guidance document describes the types of analytical tests and the respective criteria which should be used to determine if mine waste solids are acceptable for alternative uses.	This document provides updated guidance for required testing per the 2015 Update Nevada Modified Sobek Procedure. The change to this regulation does not affect protectiveness.		
100-year flood plain requirement. Executive Order no. 11988	1995 Record of Decision	These requirements provide that within areas subject to a one percent or greater chance of flooding in any given year, actions shall be taken to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and restore and preserve the natural and beneficial values of flood plains.	Revisions to Executive Order no. 11988 are documented in Executive Order 13690. The change to this regulation does not affect protectiveness.		

Appendix D. Toxicity Assessment

Chemical-specific ARARs identified in the 2013 Explanation of Significant Differences for soil were evaluated (Table D-1). EPA selected soil cleanup levels for residential buildings in the 2013 Explanation of Significant Differences and as described in the 2018 Long-Term Sampling and Response Plan for Residential Development (Plan). EPA adopted Regional Screening Levels (RSLs) as soil cleanup levels. EPA's Integrated Risk Information System (IRIS) updates toxicity values used by EPA in risk assessment when newer scientific information becomes available.

EPA evaluated the cancer and non-cancer health risks from exposure to mercury, arsenic, and lead by various exposure pathways in the Human Health Risk Assessment, because exposure through incidental soil ingestion is a pathway of potential concern. The Human Health Risk Assessment concluded that cancer risks from exposure to the contaminants of concern were not significant, but that the non-cancer health risks for children under the age of six, living on or adjacent to contaminated areas where they could potentially ingest mercury or arsenic in soil, were at levels considered potentially adverse.

EPA established Site cleanup levels for each containment of concern (Table D-1). The cleanup level for mercury is based on site-specific data modeled in the Human Health Risk Assessment for subsurface soils. The cleanup level assumed the species of mercury generally found in the soil matrix and the bioavailability of those species. EPA's IRIS is currently re-evaluating speciation toxicity for mercury mine sites as the current EPA RSL for mercury in soil is 23 mg/kg considering the non-cancer endpoint. EPA considers the cleanup level of 80 mg/kg protective while IRIS is re-evaluating the speciation toxicity.

The EPA RSL level for arsenic in residential soil is 0.61 mg/kg, based on the carcinogenicity of arsenic and assuming that 60% of arsenic is bioavailable. However, the geology of Nevada is such that arsenic occurs naturally in soil at levels far exceeding the RSL. EPA does not establish cleanup goals below natural background levels. The cleanup level for arsenic is based on statistical evaluation of site-specific sample data by US Geological Survey and taking into account background levels typically found in subsurface soils³.

EPA's Office of Land and Emergency Management is currently reassessing the Office of Solid Waste and Emergency Response Directive on Safe Lead Levels for children, considering the Advisory Committee on Childhood Lead Poisoning Prevention's findings. The cleanup level for lead is based on the EPA Regional Screening Level. EPA currently considers the cleanup level of 400 mg/kg protective

³ Soil samples collected adjacent to and nearby the mineralized zone of the geologic formation containing the Comstock Lode found background concentrations of arsenic in the range of 90 to 120 mg/kg, however, the hot spots are significantly limited in their extent and distance from the parent rock.

while the Office of Land and Emergency Management is re-evaluating the Office of Solid Waste and Emergency Response Directive on Safe Lead levels for children.

Table D-1. Summary of Soil Toxicity Changes

Chemical	1995 Record of Decision ARARs/TBCs (mg/kg)	Soil Cleanup Level (mg/kg)	Basis for Cleanup Level	Cleanup Levels Below RSLs¹?
Mercury	80	80 (n)	Incidental Ingestion Exposure	Yes
Arsenic	80	32 (c)	Incidental Ingestion Exposure	Yes
Lead	Not Established	400 (n)	Incidental Ingestion Exposure	Yes

¹ The cleanup level remains protective if the cleanup level is below the RSL.

Notes:

c = cancer, n = noncancer, RSL = Regional Screening Level

To ensure children under the age of six are not exposed to contaminants of concern at levels above those shown in Table D-1, the top two feet of soil located on residential property or properties that may be developed into residential property must not exceed the cleanup levels. If characterization sampling confirms exceedances, a remediation plan should be developed and carried out.

EPA established the threshold level for mercury in soils and tailings at 1.0 mg/kg and the concentration will be used to determine the presence of site-contaminated materials. Mercury remains as the sentinel compound for site-related contamination. The presence of elevated levels of arsenic and lead at a particular location, in the absence of mercury above the natural background level, may not require the same level of management provided by the Long-Term Sampling and Response Plan unless located in a high priority Investigation Area with proximity to mill sites or tailings.

Appendix E: Public Notice



EPA WANTS TO HEAR FROM YOU ABOUT THE CARSON RIVER MERCURY SUPERFUND CLEANUP

The U.S. Environmental Protection Agency (EPA) is reviewing the cleanup of the Carson River Mercury Superfund site. Support from the Bipartisan Infrastructure Law (BIL) is being used to fund this cleanup. This large site in Nevada includes 236 mining mill sites and mine waste piles and covers parts of Lyon, Washoe, Carson City, and Storey counties. These sites and waste piles are the focus of this review.

This review will show if the approach to address the site is working as EPA intended and if it continues to protect human health and the environment.

Federal law requires EPA to review its cleanup progress for Superfund sites every five years if:

- a cleanup takes more than five years to complete; or
- if hazardous contaminants that limit use are still on-site.

What does this review include?

- Inspection of the site
- Assessment of the cleanup status
- Review of site data and records
- Review of any new laws or requirements that could affect the cleanup

EPA wants to hear from you!

EPA would like to interview community members and hear thoughts about the how the site's cleanup work is progressing. If you want to learn more and/or be interviewed, please contact one of the following project managers **before May 30, 2023**:

- Mohamed Ibrahim: 415-972-3184 or Ibrahim.Mohamed.N@epa.gov
- Andy Bain: 415-972-3167 or Bain.Andrew@epa.gov

Where can you learn more?

- Online: Visit EPA's webpage at epa.gov/superfund/carsonrivermercury
- In person: Visit EPA's Superfund Records Center at 75 Hawthorne Street, San Francisco, California. Call 415-947-8717 for hours of operation.

EPA has also set up information repositories closer to the site. You can review a hard copy of the site's Administrative Record at the libraries listed below. This record includes key documents and reports about the site. Contact the individual libraries for their hours of operation.

Churchill County Library
553 S. Maine Street
Fallon, Nevada 89406
775-423-7581

Nevada State Library
100 N. Stewart Street
Carson City, Nevada 89701
775-684-3313

Dayton Valley Branch Library
321 Old Dayton Valley Road
Dayton, Nevada 89403
775-246-6213

Silver Springs Branch Library
3905 Highway 50 West
Silver Springs, Nevada 89429
775-577-5015

EPA will complete this Five Year Review no later than September 30, 2023. When complete, we will post a copy on the Carson River site's webpage and send a copy to the libraries listed above.

Background

When this mine was active, beginning in the 1800s, miners used mercury at 236 mill sites. These locations now make up the Carson River Superfund site. Prior mining operations released about 14 million pounds of mercury into the Carson River and other nearby waterways.

In 1990, EPA added this area (about 330 square miles) to its Superfund cleanup program. The Carson River site covers more than 130 miles of the Carson River. It also includes five counties, two river basins and several watersheds in western Nevada.

In the late 1990s, EPA:

- removed over 9,000 cubic yards of contaminated soil; and
- disposed of it off-site.

Since then, EPA and Nevada Department of Environmental Protection have sampled soil in residential areas for mercury. Sampling has led EPA in some instances to remove soil found with mercury and/or covered the area with clean soil. In 2023, EPA plans to start a larger residential sampling program.

CNSB #3871169

Appendix F: Interview Forms

Five-Year Review Interview Record				
Site:	Carson River Mercury Superfund Site			EPA ID No: NVD980813646
Interview Type: In-person Interviewers: Kiley Zaubi and Justin McNabb Date: 3/29/2023 Time:				
Interviewees				
Name	Organization	Title	Telephone	Email
Darren Schulz	Carson City	Public Works Director for Carson City		dschulz@carson.org
Brianna Greenlaw	Carson City	Stormwater Manager for Carson City		BGreenlaw@carson.org
Summary of Conversation				
1) What is your overall impression of the project? Majority of the project is outside of the city. Most of the remediation is still new. Appears to mostly be an outreach, not necessarily any actions taking place. Most current concerns are focused on OU2. Brunswick Canyon is managed by Open Space. 2) Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results. None for Public Works. 3) Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses. No, if there was an issue NDEP would be contacted. 4) Do you feel well informed about the site's activities and progress? No. Would like a presentation to a board of supervisors. Do not have any current projects going on but still would like to know. 5) Do you have any comments, suggestions, or recommendations regarding the site's management or operation? Discussion and awareness but not a lot of action on cleaning up, still moving forward with the project. 6) Do you have any comments, suggestions, or recommendations regarding the project? Communicate regarding the project is currently just through email but would contact Kristie regarding any stormwater management issues. Would be beneficial for the public works to know about the boundaries for public works projects as they currently do not feel that they have a lot of knowledge on the specifics of the project. Would like a presentation during the board of directors bi-monthly meetings. Could discuss a communication strategy for areas where there hasn't been any sampling, but the property owners do want the property sampled and possibly remediated.				
Additional Site-Specific Questions				
[if needed]				

Five-Year Review Interview Record				
Site:	Carson River Mercury Superfund Site			EPA ID No: NVD980813646
Interview Type: In-person Interviewers: Kiley Zaubi and Justin McNabb Date: 3/30/2023 Time:				
Interviewees				
Name	Organization	Title	Telephone	Email
Alexia Sober	Comstock Mining	Planning Commissioner and Comstock Mining		alexia.sober@gmail.com
Summary of Conversation				
General comments/Questions with Alexia before the main questions: Comstock Mining Inc. and worked with EPA years ago and wanted to work with the Long-Term Sampling Response Plan to test the tailings at old tailings piles and old mill sites to test for mercury. All were found below the RSLs. Would like these locations to be removed from the OU1 boundary. Alexia stated that they have been on the planning committee for two years. Alexia stated that Comstock Mining Inc. would be willing to share sampling results. Alexia also mentioned that the community is having a lot of issues due to being in a Superfund a site with respect to insurance. Alexia mentioned that Comstock Mining Inc. sampled on their own parcels as well as private people's parcels. 1) What is your overall impression of the project? Would like more field work. Would like a better sampling protocol that identifies the actual mill sites that are contaminated and not the mislabeled mill sites. The National Priorities List inhibits business, residential property improvements, gardening. It's very costly. Overly bureaucratic. A big barrier and burden to the community. 2) What effects have site operations had on the surrounding community? Always a fear of uncovering contamination that property owner was not aware of. Prevents people from starting projects. Makes people want to move somewhere else. A fear in the community. 3) Do you feel well informed about the site's activities and progress? Yes because she has studied the site and has education on the matter. As a private citizen, she would not know the issues. Just that she should not eat the fish in the Carson River and tributaries. She believes the average person thinks it is just a river/water issue. Not a soil, playing out in the yard issue. Not aware of the Hg contamination. Especially as there are more transplants. Non-profit organizations have been building trails and they have been working with NDEP and have been putting out warning signs about not consuming fish. But there has been nothing on the signage on soils. Have been talking to developers that want to develop tracks inside the OU1. They are trying to develop ways to build above ground foundations and minimize utilities (less than 3 feet underground) in order to make affordable housing. 6) Do you have any comments, suggestions, or recommendations regarding the site's management or operation? Can only do so much with site management. Would need a path forward to excluding non-contaminated sites. 7) Do you have any comments, suggestions, or recommendations regarding the project? Requests to be involved in future discussions and meetings.				
Additional Site-Specific Questions				
<i>[If needed]</i>				

Five-Year Review Interview Record				
Site:	Carson River Mercury Superfund Site			EPA ID No: NVD980813646
Interview Type: In-person Interviewers: Kiley Zaubi and Justin McNabb Date: 3/29/2023 Time: 0930				
Interviewees				
Name	Organization	Title	Telephone	Email
Andrew Haskins	Lyon County Manager	Planning / Interim City Manager		ahaskin@lyon-county.org
Summary of Conversation				
1) What is your overall impression of the project? Not common to have projects in the site boundary. Doesn't think there has been any since he has been in office (2 years). Not a lot of building happening in the area, mostly OU2. Jeff Paige was former County manager and development director. New county manager is Louis Cariola 2) Have there been any significant changes to the project within the last five years? Have you noticed a trend in how many properties are being developed? Or has there been a change to the types of developments? Not very aware of changes. There is the Tradition Villages, don't know the results of the sampling. Hasn't been a hinderance of the project. Same with River Park. Silver Horn (Melanie Drive by Dollar General): Already received a tentative map from NDEP and BWPT with a condition to work with BCA. Lyon thought everything was good and moving forward. This is concerning considering NDEP said CoC's were found in high concentrations at some locations. Info is stored until the contractor comes back to the Co that conditions have been met, which can take years. They have 3 years to complete the requirements before needing to request a final map. Can be broken down into phases. The planner does not usually check to see if the property is within the OU1 and would have no way of knowing if there is an issue unless the BCA puts a condition in the tentative map. Lyon Co code enforcement does not have the power to enforce any remedy issue. They are usually notified to call Dave and Julia of the NDEP. Code enforcers can check to see if the parcel has been approved for construction. 3) How does the BCA communicate with the county? And how does county communicate with BCA? What recommendations do you have for the counties to make this process smoother or more efficient? Are there any counties that are easier to communicate with? Usually communicate with BCA via email. Not him personally, usually people in planning and building department. All saved on shared drive. Not likely keeping a record of when the NDEP is contacted. 4) Have there been unexpected difficulties at the site in the last five years? Specifically, to coordinating with developers or property owners? If so, please give details. Only at Silver Springs. Most projects have moved forward since before he was here but is expecting more development due to the new industrial park in Silver Spring (North Nev Industrial Center). Microsoft bought land in Silver Springs recently as well. 5) Have there been opportunities to optimize the Long-Term Sampling and Response Plan? Do you find the Long-Term Sampling and Response Plan to be implementable? More public or county level knowledge of the GIS setup. Sees more conflict with OU2 area. 6) Do you have any comments, suggestions, or recommendations regarding the project? Maybe need to speak to someone in the planning department.				

Five-Year Review Interview Record				
Site:	Carson River Mercury Superfund Site			EPA ID No: NVD980813646
Interview Type In-person Interviewers: Kiley Zaubi and Justin McNabb Date: 3/28/2023 Time:				
Interviewees				
Name	Organization	Title	Telephone	Email
David Friedman	NDEP BCA	Environmental Scientist		dfriedman@ndep.nv.gov
Julia Hoeh	NDEP BCA	Environmental Scientist		jhoeh@ndep.nv.gov
Summary of Conversation				
1) What is your overall impression of the project? No question in the protectiveness. Dave thinks that the remedy came too early. Doesn't fit the site and the nature of the contamination well. Focused on residential exposures from inhalation of contaminants by children; this remedy focuses on trying to characterize the soils as this large amount of land gets developed. This current remedy gives the perception that the contamination is everywhere when actually only if mercury is detected above background which is 1 ppm. Background of mercury may also actually be higher (~3 ppm identified in OU2 proposed plan). Dave thinks that the EPA should revisit the remedy. The current boundaries are too large of a site. Most people don't really see the site as a threat. There is a need to better characterize the site and develop a more appropriate remedy. Dave suggested that there should be a process to delete geographic areas from the NPL as it is characterized instead of the entire site which is likely not feasible. The remedy should allow for EPA/NDEP to shrink the boundary as areas are tested. 2) Have there been any significant changes to the project within the last five years? Have you noticed a trend in how many properties are being developed? Or has there been a change to the types of developments? More properties being developed within the last 5 years. Still a mix of residential and business. Largely single family. 3) How does the BCA communicate with the county? And how does county communicate with BCA? What recommendations do you have for the counties to make this process smoother or more efficient? Are there any counties that are easier to communicate with? Usually contacted by the planning departments (Storey and Lyon). Lyon has added a Co. code that if the location is within the Site footprints, then NDEP BCA has to be notified and that the permitted has to have proof of approval from BCA (whether they have spoken to him, need a sampling analysis plan) 4) What does the sampling data show? Are properties within the site footprint as contaminated as expected? Have any developments required remediation in the last five years? One recent one will require remediation, encountered highly contaminated material (Melanie drive and River road) Seeing unexpected hot spots, but less contamination overall as development moves away from the mill sites. New Washoe City - large, but not a lot of found contamination. Not many soil samples, but Dave initially screened using XRF. 5) How is sampling data managed? Is site boundary updated as necessary? How often is the database updated? XRF screening is not recorded. Sampling under Long-Term Sampling and Response Plan should fall under the quality control measures. 6) Who reviews SAPs and sampling results? Remediation plans? Is this information stored somewhere for future use if a further soil disturbance at a site is required.				

Julia and Dave review the SAPs and remediation. Shared with Region 9 for a dual review.

- 7) How is a No-Further Action (NFA) handled? Is a NFA issued directly to the county? Specifically with regards to the "The County will maintain a copy of subdivision sampling records and will provide informational brochures detailing the Site requirements and guidance for communication, sampling and remediation."

NFA's are handled by NDEP BCA, and the County is CC'd. Use standard language in the NFA letter.

- 8) Environmental Covenants? Does BCA follow-up with developer or county to ensure ECs are in place? Have individual lots ever requested to have an EC of "DNM" Durable Notification Mechanism removed from their property?

ECs are recorded in the Co. Recorder stamp is on the EC. NDEP has the template that they provide the property owner.

- 9) Have there been unexpected difficulties at the site in the last five years? Specifically, to coordinating with developers or property owners? If so, please give details.

Development that has happened without following the process. The tentative map does not have an expiration. So, a development could wait 10 plus years between getting the tentative map and the construction beginning.

Traditions Village agreed to do more sampling after notification but without BCA reviewing the SAP.

River Park originally was going to be a large 1000-acre subdivision and now it has been split up into many smaller subdivisions. Some developers work with the NDEP, some do not. So, the sampling is inconsistent. The sampling conducted to date found that low concentrations. Dave indicates the transport model does not favor transport tailing into the area, which may explain the low concentrations. I

- 10) In your opinion, is the remedy functioning as expected? How well is the remedy performing? Do you feel like all developments within boundaries are following the Long-Term Sampling and Response Plan?

Functioning well considering the challenges. This is a usual Superfund Site, where the parties that caused the contamination are defunct and many property owners who did not cause the contamination are affected.

- 11) Have there been opportunities to optimize the Long-Term Sampling and Response Plan? Do you find the Long-Term Sampling and Response Plan to be implementable?

Works without having to create regulation. Aware of new residential development on a consistent basis. Either through permitting issues or word of mouth about new construction

- 12) Do you have any comments, suggestions, or recommendations regarding the project?

Would like portions of the Site to be deleted from the NPL or delineated to be outside of the Site boundary.

Additional Site-Specific Questions

[If needed]

Five-Year Review Interview Record				
Site:	Carson River Mercury Superfund Site			EPA ID No: NVD980813646
Interview Type: In-person Interviewers: Kiley Zaubi and Justin McNabb Date: 3/28/2023 Time:				
Interviewees				
Name	Organization	Title	Telephone	Email
Kristie Black	NDEP BWPC	Environmental Scientist IV (Stormwater Sup)		
April Holt	NDEP BWPC	Professional Engineer (Compliance and enforcement)		
Summary of Conversation				
7) What is your overall impression of the project? April (working with NDEP Subdivisions for 5 years): Checks and balances within subdivisions that let BCA know about the subdivision. - They know by county. If it is in Lyon County, then enforcement let's Dave and Julia know, and he then drills down. - NDEP's database has an automatic notification. - Dave then coordinates if there are any issues. This is specifically for subdivision. Kristie: Cross communication with respect to the subdivision is smooth, DATABASE allows for a stored knowledge set. -They don't issue a stormwater permit until an improvement plan has been approved. An "approved tentative map" is needed to receive an improvement plan, which is when Dave is notified. --Would violate NRS and NAC (Nev admin code) -- Counties and cities also approve tentative maps (local jurisdiction), when less than 5 parcels. --- Subdivisions need an "intent to serve" from the local jurisdiction April: Intent to serve – will serve. Septic subdivisions do not have the same process. Have to do water tests if they are going to be served by a domestic water well. -Tentative map process was "foggy" 5 years ago due to loss of knowledge -- Was not receiving complete applications. Denials go to planning commission/local level. An incomplete map would show it didn't go through the county. -Construction never ceased during the pandemic. Building is starting to slow down in more rural co. Can get a comparison between what was submitted vs. what was approved in the Site counties. Kristie: BCA handles the spill hotline. If there is a spill impacting the Superfund and SW, both go out together. BCA has a spill tracking system. 8) Have there been any significant changes to the project within the last five years? Have you noticed a trend in how many properties are being developed? Or has there been a change to the types of developments? April: Lot of development in Dayton. Single-family homes due to proximity to Silver Springs with respect to major industrial areas that have recently been developed. 9) How does the NDEP BWPC communicate with the county? And how does county communicate with BCA? What recommendations do you have for the counties to make this process smoother or more efficient? Are there any counties that are easier to communicate with? Mostly through denial and approval letters. Local jurisdictions are CC'd on denial letters. Approval letters are addressed to the planning commission of each County. Communication is dependent on the County.				

- 10) Environmental Covenants? Does BCA follow-up with developer or county to ensure ECs are in place? Have individual lots ever requested to have an EC of "DNM" Durable Notification Mechanism removed from their property?

April moves forward with the *permitting* process regardless of the County, so they don't know if there are any Site remedy-based issues. They are only focused on the stormwater improvement plan.

Can issue a stormwater improvement plan (notice of intent) but that does not allow them to start construction. NCA-278

-Still need a grading permit (except Washoe and Clark since they have their own health district) , which will not be issued without an approval. The Co/City is who issues the permit, not NDEP. They send out the approval letter. Notice of intent to use the GP. Then NDEP gives the approval for the plan.

- Not notified of any stop work actions with respect to BCA

- If there is a spill, not following BMPs then no sampling is required. Just restore to baseline.

- 11) Have there been unexpected difficulties at the site in the last five years? Specifically, to coordinating with developers or property owners? If so, please give details.

-Not from what they have encountered

-More on the forefront of development

Kristie: For residences that are not Subdivisions, there are a lot of data quality issues (lat/long, County, addresses, no parcel). Won't know unless they go to the site unless they are obvious issues. Main priority is the need for a wet signature (needs to be a president or VP), so that is where the manpower is.

- 1993 database, limited resources, stormwater permits are not in the Our Permits database, nor is the Subdivisions database.
- MAIN issue: There is no BCA notification at the NDEP BWPC level if it is not a subdivision. That is on the local jurisdiction.
- The Subdivision DATABASE only notifies BCA for Lyon Co. Not Storey or Washoe (due to the large amount of construction that is not near the Site).

- 12) In your opinion, is the remedy functioning as expected? How well is the remedy performing? Do you feel like all developments within boundaries are following the Long-Term Sampling and Response Plan?

If a Subdivision is in a floodplain, then they do have to provide a FEMA map but even then, enforcement cannot deny. The only factors for denial are if they did not submit the appropriate data or if the WWTP or domestic water cannot support the location.

Do need a SWPP before construction begins and when BWPC goes onsite. One is not needed for an NOI or a "will serve". This is due to conditions possibly changing.

BCA – effect public health/safety

- 13) Have there been opportunities to optimize the Long-Term Sampling and Response Plan? Do you find the Long-Term Sampling and Response Plan to be implementable?

Can the Site boundary map be printed and broken down by TWN and then those can be sent to Dave (for Co other than Lyon Co.). Right now he is only notified for Lyon.

Additional Site-Specific Questions

Five-Year Review Interview Record				
Site:	Carson River Mercury Superfund Site			EPA ID No: NVD980813646
Interview Type In-person Interviewers: Kiley Zaubi and Justin McNabb Date: 3/30/2023 Time: 0900				
Interviewees				
Name	Organization	Title	Telephone	Email
Pete Renaud	Storey Co	Building Official		prenaud@storeycounty.org
Kathy Canfield	Storey Co	Planning Manager		kcanfield@storeycounty.org
Lyndi Renaud	Storey Co	Planning Assistant		lrenaud@storeycounty.org
Austin Osborne	Storey Co			aosborne@storeycounty.org
Jason Wierzbicki	Storey Co	Public Works Director		jwierzbicki@storeycounty.org
Summary of Conversation				
1) What is your overall impression of the project? BCA and EPA had discussion on what the remedy is. Lyndi: Would like to know if the mercury is still there. A lot of the work seems like it is based on assumptions and dated information. Would like additional information on what has been happening/progressing with the status mercury in the area. -Sarah notes that there has been some sampling and have found Hg and tailings along 6-mile canyon near Butters Mill has had CoCs Kathy notes that the town has changed a lot since the mills were there and that there is likely a chance that the conditions have changed. Is the remedy still applicable to this area? Is it necessary? Sarah notes that there is a map that displays where the samples have been taken and displays the results. Kathy is concerned that while there is a map that breaks down the sampling results, the area of concern still envelopes the town which is a negative for prospective buyers. Pete mentions that prospective buyers will call the County to get information on the property and if the County knows that the area is within the boundary, they tell them about the possible conditions and may not be able to build. Will then tell them to go talk to NDEP BCA. Co will tell them that they can build away from the area of concern. Usually directs people to BCA. 2) Have there been any significant changes to the project within the last five years? Have you noticed a trend in how many properties are being developed? Or has there been a change to the types of developments? Austin: have been trying to get flood and drainage mitigation grants along 6-mile canyon with communication with NDEP and have had no progress. This is due to the excavation and where to locate the dirt. Right now the roads are being washed away, causing further contamination and moving the soil anyways. FEMA will not pay for remediation in a superfund site and the drainage along 6-mile is considered Superfund since it is within the OU1 boundary. Road was completely washed out in 2017 (SR79/6-Mile Canyon) which is a main road for schools and emergency services. Band-Aid instead of a perm fix. --EPA was not notified of the FEMA issue, NDEP BCA was aware, **This information needs to be passed on, more coordination needed. Kathy: FEMA is not giving any funding. Would like to get funding from some other source since Potentially Responsible Parties (PRP) they have limited funds and are spending funds on temp fixes.				

The community chest/social services agency building is not able to own the building they are on (inside a footprint) that is on a park (Park Services). This would allow them to get additional funding. They would have to replace the park in order to do this. All of the possible new park locations are inadequate. The primary location needed an environmental review via the Parks Services and they won't be able to afford the ER due to the sampling needed from the proximity to the OU1 boundary.

--No one is on the hook to clean it up, no one to pay for the cleanup. 28 years and no real progress.

--Would like to be removed from the program so they are not labeled as being within the Site boundary. Too many assumptions. Too many issues that are not being addressed. With the exception of 6-mile.

- 3) How does the BCA communicate with the county? And how does county communicate with BCA? What recommendations do you have for the counties to make this process smoother or more efficient? Are there any counties that are easier to communicate with?

There are no WWTP permits in this County. Kathy calls Dave when needed.

Sewer line pipe replacement about 2 years ago. Worked with BCA to complete a sampling plan and results. Dave is aware.

Flood diversion through a property (v-ditch at 100 flood level). The prospective buyer wanted the Co to buy 80 acres from them.

Virginia City Master Drainage Plan (Michelle Gamble with Lumous and Associates, working with Dave), funding from the EPA.

Looking to divert water away from town to prevent erosion. Bring water to 7-mile area. Looking for ways to implement water diversion in town, want to avoid mudslides while preserving the town. Will have the plan down September 2023. All work is currently just stabilizing.

Pete says there is no formal process with respect to notifying NDEP and BCA. They are really only notified for public works projects where funding will be needed or additional coordination effort.

**Suggest to have community meeting where the online resources and education are shared. Let the public know the issues and why the remedy is in place. Could ease concerns that additional testing is needed if Dave can use the XRF.

Pete notices that there has been a lot more interest in building in the county within the last five years. Notes that there is not a lot of passed on education concerning the remedy and how to implement it.

Usually notified via phone call about interest in a parcel, then they are recommended to planning. Then the permit process is a form with a checklist. Building/grading/construction projects are generally not passed onto NDEP (Dave is not notified) unless it is a public works project.

Kathy is very conscious of the economic stress that sampling puts on the residence. The Superfund label is detrimental to the community improvement. There are a lot of buildable lots in town but the utility construction would be too expensive for a single-family home and single purchaser.

Dave notes that ideally, we would be able to characterize the "site" so the contamination can be delineated and then portions of the site can be delisted.

Justin: FEMA and State Div. of Emergency Management (DEM) came out to look at the damage along the SR79 and was not aware that this was a Superfund site. County has received no response on additional funding or labeling the issue as an emergency. Mike Bullien is the EM and has been coordinating with FEMA. DEM wanted to make sure that the damage had reached a certain threshold before categorizing the damage.

The repairs would keep the material on site and stabilize and sequester the soils.

Kathy: Most emergency services and remediation efforts are focused on the river.

For the sampling that does take place, are you aware of the results? What does the sampling data show? Are properties within the site footprint as contaminated as expected? Have any developments required remediation in the last five years?

No, know that some with the PW takes place but do not know the results. Archaeologists are needed for large projects.

4) How is sampling data managed? Is site boundary updated as necessary? How often is the database updated?

County relies on the contractor to supply data to BCA for PW projects.

There was a private purchaser that reached out to Dave about building on single parcels for single family home.

The RV park did reach out to Dave because they were refinancing their mortgage and the bank said that sampling was needed (Phase I, Dave not notified until Phase II). Sampling took place, NDEP BCA resulted in NFA. Above background, below RSLs

5) Do you have any comments, suggestions, or recommendations regarding the project?

Kathy says Dave is very easy to communicate with and really appreciates it.

Pete would like to work more with Dave on the smaller scale building side of things.

Justin: communication breakdown with all of the State and Federal agencies. The FEMA rep did not know that this was a Superfund site.

Additional Site-Specific Questions

[If needed]

Five-Year Review Interview Record			
Site:	Carson River Mercury Superfund Site	EPA ID No:	NVD980813646
Interview Type: In-person Interviewers: Kiley Zaubi and Justin McNabb Date: 3/30/2023			
Interviewees			
Name	Organization	Title	Email
Alan Jones	Washoe County Planning & Building	Utility	AJones@washoecounty.gov
Dwayne E. Smith	Washoe County	Engineering	DESmith@washoecounty.gov
Trevor Lloyd	Washoe County	Planning	JLowden@washoecounty.gov
Joanne Lowden	Washoe County	Parks	JLowden@washoecounty.gov
Brian Bass	Washoe County	Engineering/Remediation	jenglish@washoecounty.gov
Jim English	Washoe County	Health	jenglish@washoecounty.gov
Wes Rubio	Washoe County	Environmental Health Specialist Supervisor	wrubio@washoecounty.us
Summary of Conversation			
1. Started off with a summary of the remedy and Washoe Co's responsibility Washoe County was told that they are out of the Superfund sites/limits, including Pleasant Valley. Health District has never been included in anything to do with the Superfund site. Dwayne: Another development called Sierra Reflections that is in the process of being permitted, will have large sewer utility constructed. There was some initial discussion but no formal SAP, not authorized. Probably just minor Geotech. Day Break development had something similar where sampling occurred with levels above RSLs and additional conditions had to be included (no swimming pools). -Capped the soil with a 4-foot cap. -Added a no pool planning code on all parcels -All parcels have 0-11 Hg -Capped Parks at 4 ft --Originally Hg levels exceed RSLs Only mercury and arsenic found on site, arsenic was background. No lead. Maps of the general CRMS site supplied by NDEP were presented to the group in the room, with an inquiry by Washoe representatives as to what the hatched purple area represented around various areas of Washoe Lake. Explained the hatched purple areas on the map are areas that have not been studied fully at this time. The interview team also explained action levels for all COCs. County needs to know when this is a State oversight issues and when it is a County issue. There is too much gray area in this county due to lack of sampling. NDEP BCA uses best judgement to decide what needs to be sampled. Is there a list of characteristics that NDEP BCA can use? Wes: As far as the risk assessment, he has encountered areas where Hg was not expected but was encountered. He is concerned about the where the contamination is coming from. Multiple attendees in the room referenced one possibility coming from cinnabar deposits in the Steamboat Creek area. 2. How should the projects be communicated with BCA? Bureau of Water Pollution Control (BWPC) should still reach out to BCA. Would like some educational meetings done in the near future for both OU1 and OU2. High turnover has resulted in loss of knowledge. Would like a GIS overlay. Currently updating their Master Plan and could add that to their map. Health Dept had issues trying to find remediation methods for Hg in soil. Would like to have guidance documents on sampling, remediation, who to contact. -Jim: there needs to be notification method for single-family residences			

No way for the County and State to check what for was authorized/permitted/etc. for each other. The only form of communication is by knowing that NDEP BCA should be contacted except for via BWPC tentative map.

3. Do you have any comments, suggestions, or recommendations regarding the project?

What about recreational sites? Parks, drainage areas, etc.?

Sarah: Not part of the Site remedy but will need to follow BMPs. Health: Follow 4-foot cap. Not too concerned due to length of exposure.

Wes: all of the ECs and SAPs are good in theory but they need to be enforceable. Needs to be in building requirement code. Easy to comply and view any non-compliance.

Additional Site-Specific Questions

[If needed]

Five-Year Review Interview Record				
Site:	Carson River Mercury Superfund Site			EPA ID No: NVD980813646
Interview Questionnaire				
Date: 27 June 2023				
(Fill in the components below, one line per person if multiple persons are providing responses)				
Name	Organization	Title	Telephone	Email
Andrew Bain	EPA/R9	RPM	415-972-3167	Bain.andrew@epa.gov
(Record responses to the questions below)				
14) What is your overall impression of the project? Carson River Mercury Site (CRMS) is a mature, extensive and challenging site with a diverse network of federal, state, county and local interested stakeholders. The OU1 remedy is generally well addressed with respect to LTSRP compliance by new residential subdivisions, and interest to file ECs. 15) Have there been any significant changes to the project within the last five years? OU1 BIL funding was awarded to the project to sample and potentially remediate yards of single-family homes (SFH). These SFH yards either have not been sampled since the 1993/94 RI, or, in numerous cases, the homes were constructed without county building department notification to NDEP (or EPA). Collaborative scoping and review of the OU2 RI/FS has been on the forefront of EPA's efforts the past five years, leading up to the interim ROD (anticipated Sept. '23). Have you noticed a trend in how many properties are being developed? The trend appears to be on the rise again since the economic slowdown of 2008. Residential construction projects are presently evident in the Dayton, Mark Twain, Virginia City and Steamboat Creek areas that overlap the site investigation boundaries. Or has there been a change to the types of developments? The RPMs have observed a number of new SFH (recent or actual construction) and for-sale signs posted near mill sites and tailings piles in Six Mile Canyon. 16) How does the BCA communicate with the county(ies)? BCA conducts approximately annual outreach with the counties, as described in their Cooperative Agreement work plan. And how does county communicate with BCA? Depending on the county and relationships, the building and planning departments may reach out to BCA directly or are referred by the NDEP Stormwater program. I am unaware of the extent that the counties consistently refer projects that meet the LTSRP threshold (i.e., 1 acre, 3 cubic yards of soil grading/excavation permitted). RPMs have frequently observed SFH construction, especially in Storey Co., that overlap with the maps and with evident tailings material in the very near vicinity. What recommendations do you have for the counties and NDEP to make this process smoother or more efficient? a. Counties, with BCA assistance, should improve LTSRP education and outreach to lenders, realtors and economic development parties. b. Counties should better utilize the CRMS StoryMap application, which includes general information and link to the LTSRP as well as an address lookup tool (coordinates or physical address). c. BCA should return to producing and sharing tracking document (spreadsheet) summarizing all LTSRP inquiries, specifically the properties that proceed to sampling/remediation. This is a BCA CA workplan task but hasn't been updated since approximately 2021. d. BCA has not clearly explained to EPA the steps BCA follows to screen and determine which properties are not recommended for further sampling. EPA should be provided documentation about the decision-making steps. e. For OU2 RD, EPA should expand the GIS database to create a one-call type dig notification system (akin to the Terradex software app). This is envisioned to optimize the county permit notification process. Are there any counties that are easier to communicate with? Lyon and Churchill have traditionally been more proactive and appear to work well with BCA (and EPA) in terms of consulting the agencies about potential projects. Although technically outside the scope of the OU1 remedy, the counties frequently refer non-residential construction projects to BCA, especially in the vicinity of existing housing, tributaries and/or water bodies. In these cases, BCA adapted the residential LTSRP and uses the mercury RSL (elemental), which is more				

conservative, rather than the OU1 action level (based on bioavailability for the predominant mercury species). This provides collateral benefit with respect to protectiveness.

- 17) What does the sampling data show? ***In general, the LTSRP soil sampling results have been mixed, depending on the source and/or depth of excavation. In addition to overseeing the third-party sampling (i.e., by Certified Env. Managers), EPA and BCA have conducted several sampling pilots in the OU1 and 2 areas (as part of the OU2 RI and CSM updates). We've observed that the distribution of COCs varies widely. Visual tell-tale signs, such as discolored soil, are not always predictive indicators of COC exceedances. Are properties within the site footprint as contaminated as expected? It really depends on the source. In the pilot XRF DMA Study (2017) and the ISM Study (2019), the EPA team observed hotspots in the vicinity of sources, although very little apparent migration to adjacent decision units. Conversely, at one property located in OU2, well below Lahontan Dam, we encountered a property with significantly elevated concentrations of mercury. The property was in the footprint of the historic river channel and the rancher had excavated approximately 10 feet into the floodplain to create a pond. Have any developments required remediation in the last five years? The developers at the Melanie Drive property (in the Six Mile Canyon Fan, Dayton, near River Rd.), sited atop a former heap leach operation, have dropped interest in the project. Additionally, Washoe County approached BCA and EPA about the Talus/Daybreak Subdivision (South Reno) with questions about avoiding ECs if they were to import eight feet of clean fill and cover the entire footprint. The present status of both projects is unclear. BCA staff and the OU1 RPM have the files.***
- 18) How is sampling data managed? ***BCA stores the LTSRP reports, while the GIS data is periodically exported to EPA, where we manage the official GIS database. EPA developed ESRI GeoPlatform for project team use and the StoryMap application as the public-facing mapping tool. Is the Site boundary updated as necessary? The Site investigation boundaries were last updated for the StoryMap rollout (2021). BCA provided extensive support in terms of integrating the various lines of evidence used to determine the probable COC migration pathways. EPA and BCA refined the map footprint, originally based upon the entire watershed, to focus on the vicinity of mill sites, tailings piles and downgradient sediments/tributaries. How often is the database updated? A geodatabase update is due – FEMA's 100 yr. flood coverage is in draft form, especially for Churchill Co. is due Summer 2023 (CWSD or FEMA will provide it). Additionally, BCA staff are very interested in refining the investigation boundaries. They should do so based upon new CSM information, including the ISM study previously referenced, the current ICF data gap analysis and residential sampling outcomes, to improve accuracy of the predictive tool.***
- 19) Who reviews SAPs and sampling results? ***BCA reviews the site-specific work plans, SAPs and results submitted by third-party Certified Env. Managers. Of note, the current LTSRP SAP is still in 'conditionally approved' status by EPA R9 Quality Assurance Management Office (QAMO). This is pending a joint EPA/BCA 'start to finish' review of a representative subdivision following the LTSRP process. QA review would include workplans and reports including sample design, data submittals and agency decision logic. To date, BCA has declined to conduct this evaluation, despite two requests from the RPM team. Remediation plans? Is this information stored somewhere for future use if a further soil disturbance at a site is required. If I understand the question, BCA retains the remediation plans with the file along with the ECs, if entered. The LTSRP and ECs only specify two-foot disturbance.***
- 20) How is a NFA handled? ***The OU1 RPM (approximately 2020) advised BCA to refrain from using the NFA term, which is a PA/SI step and inherently an EPA function as the site lead. EPA RPMs have a general sense of how the screening process is undertaken. QAMO has observed the same. The actual screening SOPs and documentation procedures remain unclear to this RPM (see response #6). Is a NFA issued directly to the county? Unclear. Specifically with regards to the "The County will maintain a copy of subdivision sampling records and will***

	provide informational brochures detailing the CRMS requirements and guidance for communication, sampling and remediation." No first-hand experience with how the counties maintains sampling records about individual subdivisions; rather EPA relies upon BCA to implement the program, including summaries. 21) Environmental Covenants? Does BCA follow-up with developer or county to ensure ECs are in place? It is our understanding that BCA follows up and retains copies of the EC, which they make available on their website. Have individual lots ever requested to have an EC of "DNM" Durable Notification Mechanism removed from their property? Not aware of this circumstance. 22) Have there been unexpected difficulties at the site in the last five years? Specifically, to coordinating with developers or property owners? If so, please give details. a. Traditions (near Sutro Tunnel) - contractor Brown and Caldwell conducted their own LTSRP without submitting a work plan in advance to BCA. BCA and EPA have not approved the workplan, observing that the sample distribution is inadequate. b. During a site visit with RPMs Watson and Ibrahim in November 2022, BCA identified new subdivision on Spring Creek Dr. near Riverview Elementary School that apparently had not undergone LTSRP approvals. c. Santa Maria Ranch – ECs are still non-existent although spec. developers are still constructing new homes (infill). RPM understands future project phases will follow the current LTSRP, presumably including ECs. 23) In your opinion, is the remedy functioning as expected? The remedy is functioning generally well with respect to commercial residential subdivisions. How well is the remedy performing? EPA is not presently aware of any obvious protectiveness issues in OU1. The remedy appears to be adequate, considering the very large footprint and unique reactive remedy nature. Do you feel like all developments within boundaries are following the LTSRP? No, see responses #2 and 9. 24) Have there been opportunities to optimize the LTSRP? Yes, see response to item #6. Do you find the LTSRP to be implementable? Yes, generally, with regard to commercial residential subdivisions. For SFH, BCA may consider prioritizing their resources to expand education and outreach to interested stakeholders, including lenders and realtors. 25) Do you have any comments, suggestions, or recommendations regarding the project? Additional resources be considered to address the Steamboat Creek watershed (OU1 and 2).
	Additional Site-Specific Questions <i>Not Applicable</i>

Appendix G: Site Inspection Report and Photos

Carson River Mercury Site, Washoe, Storey, Lyon, and Churchill County, Nevada

1. INTRODUCTION

- a. Date of Visit: 03/27/2023
- b. Location: Washoe, Storey, Lyon, and Churchill County, Nevada
- c. Purpose: A site visit was conducted to visually inspect and document the conditions of the remedy, the site, and the surrounding area for inclusion into the Five-Year Review Report.

d. Participants:

Justin McNabb	US Army Corps of Engineers	2063163993
Kiley Zaubi	US Army Corps of Engineers	2067646161
Mohamed Ibrahim	US Environmental Protection Agency	4159723184
Sarah Watson	US Environmental Protection Agency	4159723032
David Friedman	Nevada Division of Environmental Protection	7756879385
Julia Hoeh	Nevada Division of Environmental Protection	7756879523

2. SUMMARY

Mrs. Zaubi and Mr. McNabb (“USACE Team”) arrived in Reno, NV at approximately 10:00 am on Tuesday March 28th. The USACE team then drove from Reno to Carson City, meeting the EPA RPMs Ms. Sarah Watson and Mr. Mohamed Ibrahim before then heading to the Nevada Division of Environmental Protection (NDEP) to meet with Mr. David Friedman and Mrs. Julia Hoeh from the Bureau of Corrective Actions in NDEP. At the NDEP office, NDEP, US EPA, and the USACE Team met to discuss the Site. NDEP included April Holt and Kristie Black from the Stormwater and engineering in NDEP who send notifications to David and Julia whenever there is development in the Site that needs their approval for stormwater and wastewater treatment systems. This is an automated process that takes place for Storey, Lyon, and Churchill counties. Washoe County has their own health department that has delegated authority from the state. Additionally, new site developments in the region since 2018 and post-Covid-19 complications were discussed. Recently NDEP launched a web-based map to show the estimated extent of the Site. This is similar to the previous FYR finding but updated with additional features such as sampling locations and the results at each GPS tagged location.

During the discussion it was brought up that Storey and Lyon Counties are the principal entities to inform developers about the sampling requirements. Lyon county planning department adds a requirement if the development is within the Site to contact NDEP and provide documentation that they have approval from NDEP.

After the discussion, NDEP, EPA, and the USACE team drove around the Carson City County extent of the Site where two mill sites are now in the footprint of the golf course, Empire Ranch. The group then returned to the NDEP offices and adjourned for the day.

On the morning of Wednesday March 29th the team drove to the Lyon county seat in Yerington, NV to discuss the performance of the remedy from the county perspective. The team met with Andrew Haskins at 0930 and discussed the process of reporting from the county perspective. The county reinforced what NDEP had stated the previous day about the automated reporting process. Departments in the county have the contact information of the Bureau of Corrective Actions and will contact them directly if there is any development within the Site.

After the meeting at 1030, the team did a variety of site visits on the return trip, visiting the new development near the Riverside Elementary school where sampling was insufficient as per the current Long-Term Sampling Response Plan.

The next location was the prospective property purchase near the St. Ann Roman Catholic Church (Melanie Drive). This property was initially investigated by NDEP in advance of a perspective property, and then again with a prospective buyer where two hot spots were found above the site cleanup levels, before the buyer backed out of the purchase. The property currently remains dormant.

After this the team went to the Traditions Village site, which was approved before the LTSRP was finalized in 2018 but completed sampling after (2021). As a result, this site has insufficient sampling that does not follow the LTSRP sampling plan lot requirement. Although more sampling was requested by EPA and NDEP, the developer does not plan take to implement the requested sampling before the housing development is complete, since no exceedances above site cleanup levels was found in the initial sampling results.

The Our Park site was visited after the Traditions Parkway development. This location was checked for erosion issues and issues with construction disturbing the cap beneath the playground. No obvious issues were noted at the park.

The Team visited Santa Maria Park development which is currently almost finished with its Phase 1 build out and will be starting the phase 2 development.

After visiting the Santa Maria Park development, the team broke for lunch. Then the team reconvened at 1500 for a visit with Carson City Public Works Director Darren Schulz and Stormwater Manager Brianna Greenlaw. Carson City was unaware of the limits of the Site Operable Unit 1 that extended into their county. In the City-County, the extent of the Site Operable Unit 1 is mainly constrained to the Empire

Ranch Golf Course. It was discussed the NDEP should be contacted if future projects disturbed the areas of OU1 in the county.

At 1600 the team left to visit three sites around Washoe Lake and on Steamboat Creek. There were small mills that operated around the lake and on the creek for a limited number of years compared to other mills in the region. Some testing has been done along the Steamboat Creek on S Virginia St, north of Andrew Lane. No concentrations were found above residential limits, but development did not continue due to other economic factors. The team also discussed other potential mercury sources in the Steamboat Creek area that are not related to historic Site activities, including deposits from a nearby cinnabar mine. NDEP staff advised that legacy impacts related to historic mines from others non-site related sources would generally be managed under the state's Abandoned Mine Lands program. After this the team finished for the day.

On the morning of March 30th the team met at the seat of Storey County in Virginia City to meet with Storey County officials. The team met with Pete Renaud, the building official, Kathy Canfield, Planning Manager, Michael Northan, Lyndi Renaud, Planning Assistant, and Austin Osborne, from the County Manager's office. The meeting was to discuss the notification process for new residential developments. Storey County does not have a large amount of development in the Site due to the topography and development constraints in the area. The county mainly took issue with the limitations the designation of being a Superfund site had on their ability to get federal funding for other resources such as drainage improvements or funding from Emergency Management agencies.

After visiting with Storey County, the team met with Comstock Mining Alexia Sober who was also a resident of Virginia City. Her comments were about their remediation work on Comstock properties.

The team then broke for lunch in Virginia City before driving to the Washoe County seat in Reno, Nevada at 1330.

The team met with Washoe County officials Kelly Mullin; Planning and Building Division Director, Alan Jones; Utility, Eric S Crump; Operations, Dwayne E. Smith; Engineering, David Solaro; Asst. County Manager, Chad Giesinger; Planning, Trevor Lloyd; Planning, Joanne Lowden; Parks, Brett Simerly; Roads, Brian Bass; Engineering/Remediation, Jim English; Health, Erin Dixon; Health, and Wes Rubio; Environmental Health Specialist Supervisor at 1330 in Reno, Nevada. During the meeting it was revealed, that since the county was allowed to operate their own environmental health program, they were unaware of the boundaries of the Site within their county from Washoe Lake down along the Steamboat Stream. The discussion with Washoe county involved conversations about other developments near the Steamboat Stream watershed that have had high mercury contamination (downgradient of a known cinnabar mine) and their efforts to handle residential safety with this development. Washoe County was concerned that there may be additional contamination from the movement of Steamboat Stream. A future meeting between NDEP, the EPA, and Washoe County Health was recommended to make sure an appropriate plan was in place for future developments in the southern portion of the county.

After visiting with Washoe County personnel, NDEP, EPA, and the USACE team split to end the day before returning to their respective home cities.

3. DISCUSSION

Noted issues when performing the site visit was a lack of communication between regulatory agencies at the State/Federal level and the local authorities, specifically in Washoe County. Additional efforts should be made to make these communication lines more robust to stay in line with the LTSRP. Additionally, some legacy developments that were approved before the LTSRP was finalized in 2018 are either in progress or completed (in progress Traditions development in Dayton, completed River Park development north of Dayton).

Photo 1. Image of the Riverview properties in the distance where development has occurred but has not followed the 2018 finalized Long-Term Sampling and Response Plan



Photo 2. Image of the 6 Mile Canyon and Melanie Dr. alluvial, a site of potential development. Initial testing performed by a previous prospective developer has indicated high concentrations of Mercury.



Photo 3. Image of the Traditions Development in progress where sampling has not followed the finalized 2018 LTSRP



Photo 4. Image of the hill to the north of Our Park with known contamination in the Rose ditch on the hill.



Photo 5. Image of the Union Park playground and the swing supports that go into the cap under the playground.



Photo 6. Image of the Our Park drainage imaged in the previous FYR that had erosion issues potentially exposing the sub cap materials.



Photo 7. Image of a previous mill site that has been investigated with no downgradient concentrations above residential levels along Steamboat Creek in Washoe County.



Photo 8. Image of a reported previous mill site on the shore of Washoe Lake that has been turned into a park. Currently underwater due to heavy precipitation

